GAS JOURNAL, MAR. 6, 1946

VOL. 247 98th YEAR No. 4320

RESEARCH AND TRAINING FOR INDUSTRY

DURING recent weeks we have discussed at some length the question of education for business, in particular calling attention to the recent issue by the Cambridge University Appointments Board of a bulletin entitled "University Education and Business." This matter was commented on in our issue of Feb. 20. Since then there have been several interesting talks on this problem of the relationship between education and industry, one of these discussions following a Paper given to the Eastern District of the Southern Association of Gas Engineers and Managers on Tuesday of last week, the Author being Dr. Venables, who is Principal of the Southend Municipal College. We shall return to his observations later.

A few days prior to this Sir Edward Appleton, Secretary of the Department of Scientific and Industrial Research, addressed the National Union of Manufacturers, his subject being the linkage between scientific research and industry. All industrialists must believe that science is destined to help them. The scientist, however, is not a magician; he neither produces new industries, nor does he produce rabbits out of his hat. Industries grow greatly from the application of research, and as often as not such research and its ultimate application in industry takes time. The Americans, who have a reputation for speed in this regard, have suggested that it takes something like 20 years from an idea being conceived in a laboratory to its application in production. Sir Edward Appleton suggested that if we, as a nation, wish to establish new industries quickly we must reduce this time by half, or even less.

Let us regard for a moment the relationship between the industrialist and the scientific worker. It matters not whether the industrialist understands the details of the reasoning of the scientific worker, but he must have some understanding of what the whole problem is about. The industrialist must have a fresh outlook and an open mind. Traditional knowledge is not necessarily wrong, nor does it follow that the practical man practises the mistakes of his forerunners, but the fact remains that the traditional method as understood in this country lacks flexibility. A new development in a particular phase may well break down the structure of a traditional method. Apart from all this, there is evidence in plenty that big advances in industry come from the steady application of basic research, and it is true, too, that day-to-day problems of industry are best solved by applied science. Finally, pure science and applied science use the scientific method. We have paraphrased in the foregoing some of the thoughts expressed by Sir Edward Appleton, and we are in entire agreement, just as we agree with his view that on the technical side the best qualified "lookout" man for an industrial ship is the trained scientist. He is the man likely not only to see the rocks ahead, but also the most likely to sight the new world first. Management, however, remains the captain of the ship. After the "lookout" men have reported, the course which their ships steer depends upon the management.

We have referred to the Paper by Dr. Venables, which was on more concrete grounds than the discourse by Sir Edward Appleton. Industry, argued the Author, needs employees with the right abilities and aptitudes in the right place at the right level; while education must be concerned with the selection of such aptitudes and the raising of abilities so that individuals are placed and trained for appropriate work. Education and industry coalesce in the aptitudes and abilities of the individual. Industry must, therefore, be closely concerned in fostering work on aptitude tests, and there can be no question that both parents and pupils should be afforded a better chance of making individual choice. Above all, there is a necessity for much greater well-informed publicity of what careers are open to young people in all industries, and not least the Gas Industry, for it does seem that at the present juncture the Industry is not essentially attractive to the young mind. This is due to a misconception of the Industry's progress and of its potentialities We have no doubt whatever about this, but the whole problem demands both thought and action.

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DEVELOPING THE DOMESTIC LOAD

ON previous occasions we have spoken of the good work which is being done by the Domestic Development Committee of the British Gas Council under the Chairmanship of Mr. Tom Brown, and we have followed with the greatest interest the ideas which have been suggested by this Committee for the setting up of District Development Centres. We think there are great possibilities attached to the establishment of such Regional Centres, and it hardly seems to us necessary, in view of the Industry's vast potential reserves, to restrict these Centres to two or three.

For long regional sales activities have appealed to us. For example, it is not hard to imagine the influence on builders, architects, local authorities, and so on, of regional showrooms. Such showrooms could be served with information from Regional Development Committees working co-operatively with the Central Development Committee at headquarters. So many questions, such as gas tariffs, fixing charges for appliances, costs of maintenance of apparatus, and so on, remain to be agreed upon on a much broader basis than exists to-day—all in the interests of presenting a united front in discussion with responsible Government Departments and the like.

For some time the industrial load has lacked any precise definition. In assessing the percentage of the industrial gas sales undertakings have been apt to have their own isolated and singular ideas. Some include, shall we say, central heating of other than domestic premises; others include such a load as large scale cooking. This unquestionably results in confusion, and this confusion should, in the interests of all concerned, be eliminated. It would be most helpful in planning programmes and also in bringing into relief weak spots. The whole scheme of things in this direction appears to us to have been haphazard, and one cannot have much satisfaction with present incoherence. It is therefore good to know of the progress being made by the Domestic Development Committee of the B.G.C. regarding the compilation of reliable statistics and clear definitions of domestic industrial, and commercial gas loads.

The Field of Science

We all talk glibly of "science," and I am certain that the word means different things to many men. The word "science" from a derivative standpoint signifies fundamentally "knowledge," but in modern times this general meaning has been circumscribed to represent primarily those fields of knowledge where truth is sought by measurement and experiment. There are many other areas of knowledge just as valid as the scientific, where other criteria prevail, and we scientists must never allow ourselves to become so hidebound as to fail to recognize this fact. Anyone who thinks that great painting can be achieved by adherence to rigid rules, or that the truths of religion can be proved like the binomial theorem, is barking up the wrong tree.—From a Paper to the Canadian Section of the Society of Chemistry and Industry by F. J. Curtis, Chairman of the American Section.

FOREMANSHIP.

Written primarily for the Gas Industry, but equally useful to the foremen, supervisors, and inspectors of all public utilities, a booklet entitled "Notes on Foremanship" is now on sale at the "JOURNAL" Offices, 11, Bolt Court, Fleet Street, London, E.C.4. The price is 1s. 6d. per copy; 15s. per dozen copies, post free.

1946 "JOURNAL" Directory

Page 2.—ABERYSTWYTH. I. W. Thomas, *E. & M.*, *vice* A. H. Sayers.
" 8.—BISHOP'S STORTFORD. H. I. Wright, *E. & M.*
" 52.—NOTTINGHAM. R. M. Wilkinson, *E. & M.*
" 56.—PRESTATYN. R. O. Roberts, *E. & M.*
" 70.—TOTTENHAM. H. C. Smith, *M.D.*; E. C. Woodall, *M.D.*, W. Hawkyard, *C.E.*
" 86.—DUNS. W. Malcolm, *M.*
" 86.—ELGIN. F. B. Kerr, *E. & M.*
" 129.—IMPERIAL CONTINENTAL. E. F. Dadson, *M.D.*

Diary

Mar. 8.—London and Southern District Junior Gas Association: "Domestic Gas Cookers—The Design of the Hot-Plate," E. W. B. Dunning, Gas Industry House, 7 p.m.
Mar. 11.—Women's Gas Council Executive Committee: 1 p.m., Gas Industry House.
Mar. 12.—British Gas Council: Gas Industry House, 3 p.m.
Mar. 12.—National Federation of Gas Coke Associations: General Committee, 10 a.m., Gas Industry House.
Mar. 13–30.—"Good Heating in the Home" Exhibition arranged by the Solid Smokeless Fuels Federation, Royal Horticultural Hall, Westminster.
Mar. 13.—B.G.C. Domestic Development Committee: 2.30 p.m. Gas Industry House.
Mar. 13.—North-Western Fuel Luncheon Club: "Parliamentary Impressions," Sir Gordon Macdonald, Engineers' Club, Albert Square, Manchester, 12.30 for 12.45 p.m.
Mar. 18.—London and Counties Coke Association: Finance Committee, 11 a.m.; Executive Committee, 11.30 a.m.; Central Committee, 1.30 p.m., Royal Horticultural Hall, Vincent Square, Westminster.
Mar. 20.—Manchester and District Junior Gas Association: Visit to works of Manchester Oxide Co., Ltd. Short Paper by H. B. Avery.
Mar. 21.—Midland Counties Coke Association: Eighth Annual General Meeting. King Edward House, 135, New Street, Birmingham, 2.30 p.m.
Mar. 22.—London and Southern District Junior Gas Association: Reception and Dance, Caxton Hall, Westminster.
Mar. 23.—London and Southern District Junior Gas Association: All-day conference at Gas Industry House, including six Technical Papers covering Education, Gas Manufacture, and Gas Utilization.
Mar. 23.—Midland Junior Gas Association: President's Day; Visit to Bilston.
Mar. 26.—Southern Association of Gas Engineers and Managers (Eastern District): "A New Method of Increasing Retort Tightness," A. Bird, London Manager of West's Gas Improvement Co., Ltd., Gas Industry House, 2.30 p.m.
Mar. 28.—Midland Association of Gas Engineers and Managers: Annual General Meeting, King Edward House, New Street, Birmingham, 2.30 p.m.
April 12.—North British Association of Gas Managers: Spring Meeting, Lesser Town Hall, Coatbridge, 10.30 a.m. Presidential Address, Mr. T. S. Lockhart, Rothesay.

Personal

At a meeting of the British Gas Council on Feb. 12, Colonel H. C. SMITH, C.B.E., D.L., J.P., was appointed Acting Chairman of the Council during the absence, owing to illness, of the Chairman, Mr. A. E. Sylvester.

* * *

The resignation is announced of Mr. RUSSELL LOWMAN from the Gas Light and Coke Company. Mr. Lowman joined the Company in 1934, and was appointed Gas Sales Manager in 1935. On the outbreak of war he rejoined the armed forces, commanding an artillery regiment. He saw service in France, the Western Desert, Sicily and Italy, finally serving on the staff of the 2nd Army throughout the campaign in North-West Europe.

* * *

Mr. K. L. CLARK, formerly of the Weston-super-Mare Gas Company, has jointed the technical staff of Messrs. W. J. Jenkins & Co., Ltd., of Retford, Notts, and 28, Victoria Street, S.W. 1. Mr. Clark has had six years' war service, initially with the Somerset Yeomanry and finally with the Royal Engineers, in which he held the rank of Major. He was on the staff of the Chief Engineer (R.E.), Berlin Area, and was the British representative on the Allied Gas Control Committee for Berlin.

Obituary

Mr. C. M. W. TURNER, Managing Director and Founder of the Diaphragm and General Leather Co., Ltd., died at Hove on Feb. 21, aged 79 years.

* * *

The death has occurred of Mr. J. A. MACLAY, late of Whitecraigs, Renfrewshire, after an illness extending over three months. Born in 1868, Mr. Maclay joined the firm of R. & A. Main over 60 years ago, subsequently becoming Senior Representative. In 1920 he was elected to the Board of Glover & Main and its allied companies, and in 1928 he was appointed Sales Director to Thomas Glover & Co., and R. & A. Main. On Victory Day, May 8, he celebrated his 77th birthday with a dinner to his colleagues. He devoted his life to the sales side of the firm's business, and his activities were well known, not only in the United Kingdom, but in Europe and South America. His comprehensive knowledge of the various sides of the Gas Industry was invaluable, and his loss will be felt by his co-directors, members of the staff, and his many friends in the Industry.

Letter to the Editor

Plain Speaking

DEAR SIR,—I would not enter the controversy raised by your Editorial in the "JOURNAL" of Feb. 13 and the letters from Messrs. Gunn and Jennings, published in the "JOURNAL" of Feb. 27, if it were not that it gives me an opportunity to emphasize something to which I have referred many times before—namely, the need for scientists who write for an audience of practical men to express their findings in readable language.

It has long been a cause of complaint that the language used by scientific men is difficult of understanding by those not trained in that particular branch of science; scientists themselves are the first to agree that far too few of their colleagues are facile with the pen.

The scientific papers submitted to the Gas Industry are frequently very difficult to read and involve many hours of study in order to find out what they are about. The busy engineer, who is the man above all who should know what (if anything) the scientists have discovered, just cannot afford the time to decipher these documents. The result is that the Industry complains that there is too long a gap between discovery and application. By all means let scientists write in their own jargon for each other, but let us have well-written, clear, and concise papers from them for the Industry as a whole.

Your strictures are applicable not only to the Paper on which your comments were based, and I feel that the Gas Research Board would do well to appoint an editor to arrange papers for publication. Frequently the difficulty is not so much in the language used as in the presentation. Most scientific papers written for the Gas Industry are far too long. The chemist, as I well know, naturally feels that all his experimental data should be put forward. That is due to his upbringing. Every hen cackles when she has laid an egg. That, too, is her upbringing. I submit that the transactions of scientific bodies are the proper place for the main mass of experimental detail, and that quite a different technique is needed for the audience addressed at meetings of the Institution of Gas Engineers.

I congratulate you on raising this issue, and I know that the subject of the method of presentation of reports will receive the close consideration of the Gas Research Board. The problem is to bring the results of highly scientific research work to the knowledge of busy engineers and managers who want the egg without the cackle.

"*Thorncliffe*,"
Oakfield Road,
Ashtead, Surrey.
Feb. 28, 1946.

Yours faithfully,
G. C. FOXWELL.

Nationalization and the Gas Industry

While the British Gas Council has adopted a non-committal attitude in regard to the Heyworth Report and to the major question of nationalization of the Gas Industry, it has never suggested that individual comment was not desirable. We are quite sure that many people who, were it not for certain influences, would be only too happy to express their views, find themselves in the light of British Gas Council recommendations restricted if not timid. Hence we are glad to give in our columns the expressed opinions of chairmen of gas companies the proceedings at whose general meetings have received publicity in the Press. These opinions, it should be emphasized, are purely individual, and all relate to those primarily concerned with the operation of company-owned undertakings.

Mr. A. E. Sylvester, Governor of the Gas Light and Coke Company:—

As we mentioned in the "JOURNAL" last week (page 346), what troubles Mr. Sylvester most at the present time is the lamentable state of uncertainty that has been created by the issue of the Heyworth Report and its apparent shelving by the Government. There must be a long gap between the announcement of the Government's decision and its implementation, and Mr. Sylvester spoke in terms, not of months, but of years. As yet, of course, the Government has not even taken the first step of announcing any intention whatever regarding this Report as the weeks drag on. This lack of decision is, it would seem, certain to have serious effects upon the Gas Industry. "No one," said Mr. Sylvester, "knows how the consumers are to benefit from the nationalization of the Gas Light and Coke Company. The answer may simply be that to sweep away this Court of Directors and to substitute some other body composed of better—and more ruthless—men would do the trick. I am far too modest to deny the possibility."

* * *

Mr. Frank H. Jones, President of the South Metropolitan Gas Company:—

"One may, perhaps, see a distinction between nationalization and the form of ownership proposed by the Heyworth Committee; moreover, it is clear from the Report that the Committee's recommendations spring, not from any liking for public ownership as such, nor from any inefficiency of the Industry 'within the limits of the existing structure,' but from their conviction that without larger units the development of the Industry is restricted and that, having regard to the basic difference in structure between companies and municipal undertakings, 'no voluntary process is likely to be sufficiently speedy to satisfy present and future requirements.' Be that as it may, the fact remains that the compulsory acquisition of all undertakings by regional boards is the means which the Committee propose for the execution of their plans.

"Your Company," said Mr. Jones, "has never intervened, nor will intervene, in party politics. My belief that the intimate character of such a service as a supply of gas is not an appropriate subject for State regimentation remains unchanged. . . . When the plan for the Industry is eventually formulated we shall examine it with the greatest care. . . . In the meantime we do not intend that, so far as lies in our power, developments which we had in mind before nationalization was mooted shall be deferred or even delayed."

At the meeting of the Company, which was held on Feb. 27 and is reported on later pages of this issue, Mr. Jones mentioned that the Company intends to proceed with a scheme for the construction of plant of the latest design in replacement of that which is nearing the end of its useful life.

* * *

Sir Cecil A. Cochrane, Chairman of the Newcastle-upon-Tyne and Gateshead Gas Company:—

"Your Directors," said Sir Cecil Cochrane at the Company's annual general meeting, "are of the opinion that nothing will be effected by a state-owned Industry which could not be done under private ownership; that the relations between employers and employed will not be improved . . . that where inefficiency exists it has been largely due to the legislative restrictions imposed on the Industry by Parliament; and that the loss of personal touch of directors, staff, and employees with their customers and the substitution of an impersonal control will tend to destroy the efficiency of the service. . . . The case for nationalizing the Gas Industry has not been made out. . . . The public interest will not be served by such a change in the control of this Industry as is contemplated, and it is to be hoped that even at this late hour public opinion may make itself felt in support of this view."

* * *

Mr. William Cash, Chairman of the Barnet and District Gas and Water Company:—

"As a Gas and Water Company our joint undertaking might be divided" [*i.e.*, under a scheme of nationalization of the Gas Industry]. "We are at this moment uncertain if the Government propose to adopt the Heyworth Report. . . . I claim that no real benefit to the consumer is likely to be brought about by nationalization. Other questions as to how the compensation matters are to be dealt with cannot yet be answered . . . On your behalf we are watching your interest, but I suggest you should individually take any action available to you to safeguard those interests."

The remarks of Mr. Cash as Chairman at the annual meeting of the Croydon Gas Company were even more forceful. He said: "The Government have not yet stated how far they propose to adopt the findings of the Heyworth Report, and this is not surprising. Having started with a slogan of nationalization, they are now faced with the problem of how to pull to pieces and rebuild a large and complicated industry in the hands of some 800 undertakings, company and municipal, of a rough estimated capital value of £270 millions. The underlying idea seems to be that private enterprise is out to obtain profits and high dividends regardless of the consumer. The lines on which this Company, with others, has carried on have been very different. Our policy has been to serve the consumer, and our whole endeavour is directed to that end, coupled with our co-partnership scheme, and that we have succeeded is proved by the testimonials and letters of thanks which we regularly receive from our customers. In addition, over a period of years, we have carried out a considerable programme of integration. At the same time, the welfare of our employees is our continual care in our pension fund, sick benefit, staff association, canteens, &c."

Shelter Demolition and Gas Main Fracture

Police and hospital records bear witness to the danger of surface air-raid shelters which yet exist on most streets in populous areas. They are a menace to cyclists and motorists, and children crossing the road have little chance of seeing oncoming traffic. That these shelters should be demolished quickly is obviously desirable, and it is good to note that steps are being taken in many districts towards this end.

A paragraph in a local newspaper describes the method employed in Teddington, where shelters are being demolished by a two-ton steel cylinder at the end of a long pivot. This instrument, it is claimed, is capable of cracking a concrete block four feet in thickness at a single blow. As an instrument of destruction it must, within its limits, be admirable, but one wonders whether its effects are, in fact, limited only to the shelter itself. Witnesses testify to the considerable vibration caused by the falling weight. This may affect houses and buildings close by, but what about the effect on underground pipes? It is not difficult to conjecture the results of this vibration on gas mains and service pipes. In every case, before proceeding with shelter demolition, does the local authority co-operate fully with the gas undertaking serving its area? And in this general question we naturally include water and electricity services. Unless experienced opinion is sought, serious blunders may well be made.

"Good Heating for Every Home"

Preliminary details have been issued of the exhibition, first announced in the "JOURNAL" of Dec. 26, which is to be held by the Solid Smokeless Fuels Federation at the Royal Horticultural Hall, Westminster, from Mar. 13 to 30. The exhibition is titled "Good Heating for Every Home," and its object is to demonstrate how comfort in the home can be achieved by the use of solid smokeless fuels. It will be no "dream" exhibition, but a display of appliances that will actually be in production this year, with prices and names of suppliers, so that architects, builders, and housing authorities may know exactly where they stand in regard to supplies. The public will be able to see the results from research carried out during the last seven years by scientists and technologists in the appliance and fuel industries.

Every appliance or method for heating, cooking or hot water supply to be exhibited has been tested and approved in the testing and research stations of the members of the Federation.

There are open fires and heating stoves, many in operation, which provide "background" heating for other rooms by conducting warm fresh air or by circulating hot water, in addition to their primary job of open fires or stoves, as the case may be. The whole house can be warm instead of the portion round the hearth-rug. These are not "luxury" appliances. They can be installed in the smallest house without adding materially to the cost when the savings of fuel and increased efficiency are taken into account.

This is only part of the exhibition, which will have sections dealing with the latest advances in cooking and hot water supply, and insulated building construction to save fuel and increase comfort. The National Smoke Abatement Society is staging its own exhibit. All these new appliances are smokeless—they not only add to the comfort of the home, saving dirt and work, they help to remove the pall of smoke from our skies.

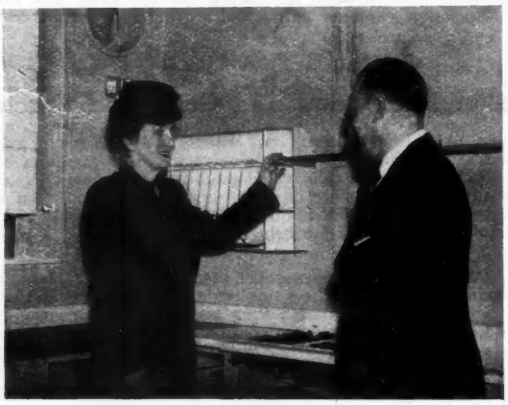
Conference on Waste Heat Recovery

In view of the widespread interest created by the series of Papers on industrial waste heat recovery, the Institute of Fuel has decided to hold a full-day conference on the subject on May 1, in the Apartments of the Geological Society, Burlington House, Piccadilly. The opening item will be the presentation of a Paper by Dr. H. R. Fehling, which will summarize the nine Papers previously presented in the series during the present session, and will bring out the industrial implications of the individual Papers.

Dr. Fehling's Paper will be followed by a discussion, the early part of which will consist of specially invited contributions. The early part of the afternoon session will be devoted to an open discussion, and the reply, which will be given later in the afternoon, will be made by the various Authors of the series of Papers on waste heat recovery.

Further Enterprise at Porthcawl

Reference was made in the "JOURNAL" of Feb. 13 to the gas exhibition which the Porthcawl Gas Department recently held in collaboration with the Ministry of Food. Another very successful exhibition arranged in collaboration with the Board of Trade has just been concluded. This exhibition was officially opened on Feb. 5 in the Grand Pavilion, Porthcawl, and the opening ceremony was performed by Miss Helen Burke, of the B.B.C.



Miss Helen Burke opening the Exhibition.

Following the speech by Miss Burke, Miss Pidsley, Assistant Secretary of the Women's Gas Council, spoke on behalf of the Council, as a result of which it was decided to form a branch in Porthcawl, which will be inaugurated in the next week or two. Following Miss Pidsley's speech a mannequin parade was organized by the Board of Trade and was a great success. The Pavilion on this day was packed to capacity.

A "Make Do and Mend" demonstration was carried on daily up to and including Feb. 16. The average attendances at these demonstrations was 103, which again was very gratifying. The demonstrators were representatives from Lever Bros., Bestway's Ltd., Singer Sewing Machine Co., Swansea Education Authorities, Monmouth Rural Industries and Women's Institutes. Sales of gas appliances, as with the previous exhibition, were very good.

Mr. D. S. Davies, Engineer and Manager, feels that the effort expended on organizing the exhibition was well worth while for the interest and goodwill it created.

Regional Joint Building Committees

Speaking at the first meeting of the Southern Region Building and Civil Engineering Joint Committee at Reading, Mr. Harold Wilson, M.P., Parliamentary Secretary, Ministry of Works, said that the Government hoped to secure the maximum degree of advice from and consultation with the representatives of the building and civil engineering industries regarding the great building programme, and these Regional Committees would bring the field of consultation closer and closer to the job.

Referring to the building materials situation, he said that while the Ministry was doing everything in its power to increase production and improve distribution of building materials, there were two ways in which builders could help. In the first place, although they were right in trying to build up stocks of building materials on the site as soon as a job was begun, they would create serious difficulties if they tried to build up stocks for long periods ahead. Secondly, he hoped that, as soon as they saw any danger of an immediate shortage of materials, they would get in touch with the Regional Officers of the Ministry, and not lay men off first and then write to the Ministry about it the following week, as had been done in some areas recently.

"Britain Can Make It"

Committees representing a number of industries have been appointed to assist the Council of Industrial Design in arranging for the submission of designs for selection for the "Britain Can Make It" Exhibition opening at the Victoria and Albert Museum on Sept. 24.

The functions of these committees will be to form a link in the administrative machine between the Council on the one hand and manufacturing firms on the other at all stages from the initial dissemination of information up to the final despatch of selected articles to the exhibition, to bring to the attention of the Council any difficulties which may arise from time to time, to assist firms by giving them information and advice without regard to whether such firms are members or non-members of trade associations, and in agreement with the Council to establish appropriate mechanism to pave the way for the Council's final selection of articles for inclusion in the Exhibition.

The committee dealing with gas heating and cooking appliances comprises Messrs. P. Brown, W. A. Bishop, A. B. Britton, G. C. Holiday, N. S. Smith, W. H. Beckett, L. Bratt, R. J. Rogers, H. F. Potter, T. F. C. Potterton, and M. W. Burt.

Food Leader Classes

Under the auspices of the Ministry of Food and Women's Voluntary Services new and different types of food demonstrations were organized last month in the Barnsley showrooms of the Sheffield and District Gas Company. This is the second occasion on which the Barnsley showrooms have been given over to the W.V.S. for this purpose.

Under the supervision of Mrs. D. Overington, the District Organizer of the W.V.S., the syllabus comprised a lecture-demonstration by Mrs. Hingst, West Riding County Council, on "Body Building Foods," and "Making the Meat Ration go Further"; a lecture-demonstration by Miss T. L. Jones, Rural Domestic Economy Mistress, on "Protective Foods"; a talk by Miss G. Nightingale, Food Advice Organizer, demonstration by a Ministry of Food demonstrator, and a "Food Quiz."

What is a food leader? A food leader is someone who is willing to pass on information about food and cooking to her friends and neighbours and to help them to get information if they want it. Food leaders do not need to have had any previous training, but they must be interested in food and cooking, and before they are accepted as suitable for food leaders they must go to a series of lectures on the "right kind of food to eat for health," "why we have rationing," &c. These lectures were not only refresher courses for all the existing food leaders in this district, but were designed also to bring in new recruits, too.

A food leader is to be found in all walks of life. She may belong to an organization, and inform members of the latest food news at the meetings of her branch. She may be a factory worker, and pass on information to the people who work with her. Again, she may be a shopkeeper and help her customers, or she may be a busy housewife who still finds time to help the people in her street or block of flats in their food difficulties. It is easy to recognize a food leader, for she wears a small "Food Leader" badge, and the symbol of a full shopping basket.

She also reminds mothers to see that the "under fives" have their cod liver oil and orange juice, and she passes on information which helps them to get these. During the war years the W.V.S., using the Barnsley showrooms of the Sheffield and District Gas Company as a distributing centre, distributed 25,491 bottles of orange juice and 2,644 bottles of cod liver oil to mothers and children in the area.

We published some time ago details of a booklet, *Common Sense Costs*, published by Messrs. McGowan, Perry, & Partners. We have now received the second in the series entitled *The Budget*, which deals with budgetary methods in all aspects of industry.

A Part of Renfrewshire is threatened with a return to the black-out. An acute shortage of mantles has exhausted the stocks for street lighting, and the lighting superintendent says that unless the position is remedied immediately the streets will be plunged into darkness. Major Guy Lloyd, M.P. for East Renfrew, is asking the responsible Minister if he will take immediate steps to ensure supplies going to Renfrewshire.

An American innovation produced with the co-operation of several corporations is a gas turbine claimed to be the simplest, most compact engine ever invented and among the most economical. Fuel, which may be either oil, natural gas, by-product gas, or possibly powdered coal, is caught in a blast of compressed air and blown into the turbine through a burner, similar to the domestic oil burner. The compressed air and combustion gases, expanding in the intense heat, spin the windmill. The power of the spinning shaft can either be harnessed directly to machinery or used to generate electricity. The gas turbine is now used with great success in many plants. It has been suggested that the new engine may ultimately revolutionize aviation.

A New Instantaneous Gas Water Heater

We recently had the opportunity of inspecting a new instantaneous gas water heater which can be used as a single-point or small multi-point appliance to supply hot water to sink and wash basin or two wash basins. This appliance is the outcome of collaboration between consulting designer and manufacturer, and we think, on short acquaintance with this heater, that between them they have produced a most pleasant design. The design in this case is due to Mr. Alexander Peet, and the manufacturers are Ranalah, Limited, 5, Queen Anne's Gate, S.W.1. Particular attention has been paid to what is now commonly known as "stream-lining," the vitreous enamelled case of the heater harmonizing with practically all colour schemes. To suit individual taste other colours can be supplied. As every housewife knows, vitreous enamelling is easily cleaned, and in this instance the complete appliance fits close to the wall.

The Ranalah Water Heater.

Technical Details.—In the design of this heater the automatic valve is operated by differential water pressure actuating a rubber diaphragm, and incorporated in the lower half of the diaphragm chamber is a venturi tube and a water throttle.

The main flow of water to the heater coils passes through the venturi throat and operates the automatic valve. Slow ignition is by means of an adjustable check valve in the lower half of the diaphragm chamber, thus controlling the rate of opening of the gas valve. The flow of water through the heater can be pre-set to give the desired temperature rise by an adjustable water throttle located at the front of the water section.

The supply of gas to the burner is controlled by a constant volume governor, and safety in operation is obtained by means of a thermal cut-off valve operated by the pilot flame.

Advantages.—The advantages claimed for the Ranalah heater include:

(1) Gas supply to the pilot jet and main burner is controlled by a single positive action lever, this being the only manual control.

(2) After lighting the pilot jet and moving the gas lever to the full on position all further control of the heater is effected by means of the tap at the sink or hand basin.

(3) The burner largely obviates maintenance attention.

(4) The water coils and heat exchanger are brazed to the body, giving maximum strength, durability, and efficiency of heat transfer.

(5) The extra large waterways not only permit the heater to be installed in hard water districts, but at the same time reduce maintenance costs.

(6) All waterways are tested to 400 lb. sq. in. water pressure before leaving the works, and the heater will operate on all water pressures up to 250 lb. sq. in.

(7) The appliance is designed for limited multi-point use and can be installed to suit the convenience of the user; it normally operates without a flue. The water and gas services can be connected either from behind or below the heater.

(8) The low required minimum head of 6 ft. is of importance to both gas undertakings and potential users alike.

(9) The pilot flame is fixed or made adjustable simply by adjustment of a screw.

(10) The heater is constructed to give free access for maintenance to all parts of the control and body. By releasing two unions the body is easily removed from the back plate without disturbing the control or service connexions.

(11) No special tools are necessary for any service or maintenance operations.

Specification.

Here is a brief specification as supplied to us by the makers:

Performance: Input, 30,000 B.Th.U./hr.; output, 22,500 B.Th.U./hr.
Mean thermal efficiency: 75%–80%.
Minimum head of water required to operate valve: 6 ft.
Pilot gas rate: 0.33 cu.ft./hr.
Pilot gas rate control: Fixed or with adjustable screw throttle.
Pilot jet: Semi-aerated; steatite head.
Main gas rate control: Constant volume governor.
Pressure point: Incorporated in burner.
Burner: Luminous multiple pinhole type.
Safety device: Bimetal thermo cut-off valve.
Slow-ignition control: Adjustable check-valve in water channel.
Gas control: Single safety lever operating both pilot and main gas supply.
Water supply: Suitable for either main or tank supply.
Water flow control: Adjustable throttle.
Type of valve: Diaphragm with venturi incorporating throttle.
Method of emptying: Large drain plug in base of heater.
Connexions: Cold inlet, ½-in. B.S.P. male. Hot outlet, ¾-in. B.S.P. male or ¾-in. copper cap. Gas inlet, ½-in. B.S.P. male capillary joint.
Overall dimensions: Height, 26 in.; width, 7½ in.; depth, 7 in. Weight, empty, 26 lb.; gross, 29 lb.
Flue outlet: None required except when heater is fitted in an unventilated space.
Fixing: By two screws.
Construction: Cream vitreous enamelled steel case fitted to a back plate. Copper body with protective lead coating. Automatic gas and water sections brass dull nickel plated. All points easily accessible for quick and easy maintenance. Heat exchanger and coils brazed to body.
Special features: Suitable for all water pressures up to 250 lb. sq. in. All waterways tested to 400 lb. sq. in. No special tools required for service or maintenance.

York Exhibition

In the belief that "fuel efficiency means fuel economy," the Ministries of Fuel and Power and Food have combined in presenting a topical "Other People's Jobs" exhibition at the York gas showrooms of the York, Harrogate, and District Group of Gas Companies.

Opening the exhibition, Miss Helen Burke, Ministry of Food B.B.C. broadcaster, emphasized to a gathering of York and district food leaders the big part housewives could play in fuel economy by attention to detail when cooking.

The whole is designed to focus attention to the extremely urgent need of making the fullest possible use of the smaller quantities of fuel at present available. Experts from the Ministry of Food demonstrated fuel-saving methods each afternoon for the benefit of visitors.

Scottish Engineering Centre

Scots, like other Britons, are not fond of display. In industry they tend to take the quality of their products as sufficient recommendation. While quality is always fundamental, it is more than ever necessary to demonstrate by display and salesmanship what that quality is. Everything therefore can be said for such a venture as the Scottish Engineering Centre—a permanent exhibition of British engineering products and equipment—which is to be established in Glasgow. Steps are now being taken to acquire central premises in the city.

For manufacturers interested in developing trade in Scotland, the Centre will provide one of the cheapest and most effective methods of bringing their products to the notice of Scottish consultants, engineers, designers, shipbuilders, contractors, local authorities, and the general public. An encouraging measure of support for the Centre is already assured, and many learned, scientific, and development institutions and associations, including the Institution of Gas Engineers, have signified their approval in principle.

The Centre, to which admission will be free, will be made attractive to the public. It is proposed to have a club-room where interested parties may meet their friends; to set apart rooms where Scottish branches of various Associations can hold meetings, and to offer a secretarial service. Tea, coffee, and other refreshments will be served. In fact, every encouragement will be offered to the public to visit the Centre regularly with a view to bringing to their notice the latest improvements and developments in British engineering.

The professional man will be able to select practically everything he requires for his project, and he will be able to obtain information regarding producers of components for his inventions or designs. The exhibits, which will be changed from time to time, will comprise appliances, machinery, models of heavy machinery, materials, &c., from all over the world, but preference will in all cases be given to manufacturers and producers within the British Empire.

The Centre will establish and maintain close contact with engineering associations in the country, with the universities and technical colleges, with the Department of Scientific and Industrial Research, and with similar departments and organizations overseas. Periodic exhibitions, working demonstrations, and film shows of particular interest to engineers, designers, and the general public will be held. Facilities will also be provided, from time to time, for engineering associations and others connected with the industry to hold special meetings and lectures.

The Centre will maintain an adequate technical staff, whose duty it will be to furnish technical and factual information to enquirers. It will also maintain an adequate library of periodical publications, reference works, and of up-to-date catalogues dealing with materials, plant, processes, and appliances.

In order that the Centre may be of the greatest benefit to all interested in engineering, it is the intention to constitute an Advisory Committee as soon as possible after the opening of the Centre. Both exhibitors and the general public will be eligible to serve on that Committee.

Modern Administrative Control for Public Utility Undertakings*

By F. W. ALLUM, A.C.A.

Secretary, York, Harrogate, and District Group of Gas Companies

WHILE a number of us may have anticipated various parts of the Heyworth Report, its ultimate effect on the Gas Industry will probably be more widely felt than any other report or investigation in the history of our Industry. Subject to what may finally be decided by Parliament, it would appear that sometime in the near future the Gas Industry will be divided into geographical regions, each of which will be controlled by a Regional Board of Directors. Without considering the comparative values of the Industry under private or local ownership and under Government control, I feel that one may for the purpose of discussion think of the Regional Board as a normal Board of Company Directors. There will be material differences in their legal responsibilities, but I must ignore those.

In these Regional Boards are to be three full-time Directors, and in the Report I am very pleased to see that the Heyworth Committee recognize the modern trend towards functional control. Each of these directors is to be responsible to the Board for certain clearly defined functions—viz., manufacture, distribution, and sales. However, there is one vital point which is not clear, and that is who is to co-ordinate the activities of the Region? If these functional directors (as I would call them), are to carry out their individual duties, they must concentrate their efforts entirely on matters coming within their different spheres, and there must be some means of ensuring that their efforts are synchronized in order to obtain the best results. It may be that it is the intention to make the Regional Chairman the co-ordinating factor, but I feel that his duties as Chairman will be sufficiently onerous as to leave him very little time for anything else. This matter must, however, be dealt with before regionalization becomes effective and I think we can assume that it has not been overlooked.

With the directorial framework as outlined I take it that there will be a Regional Central or head office, with area offices and sub-area offices throughout the region. This arrangement will not be very different from that of a large undertaking as at present operating, and from such sub-area offices through the area offices to the central office will flow those details and statistics which are so necessary for the efficient management of any public utility service.

In any large undertaking (and the suggested regions are no more than very large undertakings) administrative control must be efficient if the service to all concerned is to be the best that can be rendered.

Functional Control

I have used the term "functional control" and I would like to consider its broad meaning. It is doubtful whether such control could be applied to the smaller undertaking unless such undertaking was allied in some way to a larger one. Functional control may be defined as that form of control of an undertaking which recognizes the value of the specialist in charge of his particular sphere of operation. It does not recognize the "Jack of all trades."

In any undertaking there are certain activities which occur in the old form of departments which can be dealt with far more efficiently by the specialist than possibly by a member of the department. I do not mean that departments such as we have in our present concerns should cease to exist. They should remain, but where it is possible for certain work in those departments to come under a separate control, such control should be set up.

In order that you may more readily appreciate certain of the following points may I give you an example of simple functional control? In all departments of any concern painting and decorating work is necessary. At present there are undertakings in which there is a "works painter" who is concentrated in that section; there may be another in the Distribution Department, and as for the painting, &c., of offices, possibly this is done by a local contractor. If the control of all painting and decorating was put under one person, such person being one of the departmental heads, and a central gang of painters formed, by planning all such work of the undertaking I would say that without exception you would obtain better work at a lower cost. Planning of the work is most important, and unreasonable demands from any particular department should be curbed. Major work can be allocated throughout the year, and it should not be impossible to undertake reasonable emergency work by a slight adjustment of the work schedule. With this simple example I am certain you will understand how the idea can be extended. While many administrations are devised to act in such manner in practice for a variety of reasons, each department becomes in course of time watertight, and any form of co-operation between departments is nullified. One disturbing feature is personal jealousy. It is surprising how deep such feelings may go, and to what lengths individuals may feel justified in carrying their personal feelings to the detriment of the success of the undertaking. The modern administrator must be friendly but firm. Nobody will gain by weak administration or the allowance of personal jealousy to obscure just relations. Administrators are not born; they are normally selected by weight of experience, tact and common sense.

In regard to the General Manager, Managing Director, or whatever he may be called, the qualifications cannot easily be defined. Unfortunately for our Industry for many years the only qualification was of works experience with or without a technical qualification. Such restriction meant that the limited outlook of many managers obscured wider problems, but fortunately the tendency at the moment is to choose "managers" in their true sense; that is men who have proved that they are capable of dealing with major problems from a wide and unbiased viewpoint, irrespective of their initial training and experience. The choice of the "No. 1" of any concern is the most important task any Board or Council can undertake. If a wise choice is made, the management must be left in his hands, as after questions of policy have been decided their actual application will be his responsibility.

No Room for Obstructionists

The Prime Manager will have under his direct control certain principal executives, and he will look to them for the carrying out of his instructions in regard to the policy outlined by his Directors. Such executives will have their individual departments, but this is where functional control begins to operate. Successful functional control depends entirely on the co-operation of all departmental executives and their subordinates. One obstructionist in an undertaking can jeopardize successful management if he is allowed to continue. When the Manager finds such a person is present in his organization he must act strongly and quickly. If a personal approach is not successful in bringing the wayward one back into the fold, he must be dispensed with. This may be easier said than done, but it is imperative that means be found, otherwise the Manager may find that he is the one to be deposed.

The functions for which each departmental executive is responsible may not be easily defined in the first reorganization of an undertaking, but if there is a good team available it is surprising how each function can be accepted. I need not enumerate each particular function, but certain new ideas in the delegation of duties are worthy of individual consideration. Clear definition of duties is of great assistance, and I doubt whether anyone loses in the long run by giving adequate responsibilities to those under his control. The Executive who endeavours to retain all responsibilities is more than asking for trouble; he is inviting it. The Executive who can delegate certain duties is relieved of much detail work, and is allowed time for the more important functions for which he is responsible.

Departmental Executives

The usual departmental executives are the Secretary, Engineer, and Distribution Engineer, and in the past these had practically watertight departments, and woe betide the person who attempted to enter even physically another section. This outlook has changed considerably, but you can still find it in some undertakings.

The Engineer's duties cover a very wide field, but certain functions can be segregated—*e.g.*, supervision of manufacturing processes and constructional work. He should have under him Station Engineers whose prime duty is the manufacture of gas and its by-products. These in turn should have available skilled chemists, carbonizing superintendents, &c. The Station Engineer should not be concerned directly with constructional work. He must be consulted in the event of any such work being necessary, but the work, say, of extension of carbonizing plant or installation of new plant should not be his responsibility. It is here that the Constructional Engineer should come in, and likewise in such repair work of a major character. Obviously routine maintenance must be carried out regularly, and a general works fitter can usually deal with such work.

Under the Constructional Engineer I would place the works repair gang. He would arrange the work of such gang according to the requirements of each station. In this gang, which should be under a foreman fitter, one would expect to find not only skilled fitters, but electricians and, say, bricklayers. If the undertaking is large enough (and under regionalization or grouping large units would operate), separate sub-gangs or squads of fitters, electricians, painters, &c., would be feasible. As the Station Engineers and Constructional Engineer come under the Engineer, collaboration can be ensured. If

* Paper presented to the Yorkshire Junior Gas Association on Jan. 26, at Harrogate.

each understands the scope of his duties and the appointments clearly define the individual responsibilities, there should be no question of overlap.

Labour Problems

There is one section of the organization which materially affects all departments; that is labour. There is now established procedure for the settling of wages rates, but owing to the complexity of the various duties it is not an easy task to keep up to date with the agreements reached. Further, although our Industry comes under the Essential Works Order, the regulations as to engagement, &c., of labour need very careful watching. There are numerous other regulations which must be watched to avoid even innocent infringements.

To deal with all such problems a Personnel Officer can serve an exceedingly useful purpose. If necessary the duties of Welfare Officer can be combined, but it is possible to segregate the duties. The Personnel Officer, dealing as he may with the workmen both in the Works and Distribution Sections, must be in a subsidiary position to both such departmental executives, but he should be in a position to report direct to the General Manager if the need arises. He may have a junior officer at each works and also in the distribution section.

I have mentioned this officer's duties in connexion with two departments, but there is no reason why he should not take on similar duties in connexion with the clerical staff. While he may keep records of the senior staff, these should be dealt with by the executives under whose direct authority they are concerned.

The records which are kept by the Personnel Officer are invaluable. Not only would he have complete personal details of each employee, but he would have rates of pay, increases in pay, and status, reasons and lengths of absences and so on.

Turning to the Distribution Section, I would commend the main division of duties as between a Distribution Superintendent and the Consumer Service Superintendent. The first is responsible for everything from the boundary of the works to the inlet of the meter in consumers' premises, and from that point the latter takes control to the fixing of the actual gas-consuming appliance.

This division of duties allows for all main and service work to be individually controlled, and this is important, as the gangs employed would not in any way be concerned with the piping of houses, &c. The records required of mains and services are quite distinct from consumers' records, and the periodical repairs and maintenance of mains, &c., can best be dealt with from such separate records. Adequate information should be recorded of all mains and services, so that any part of the undertaking's area can be investigated at any time or for any reason, position of mains, syphons, &c., being only part of the information necessary. Date and cost of repairs, &c., are also important for reference purposes.

Consumer Service

Consumer service is often confused with sales of appliances, and it is essential that the difference should be appreciated. The Sales Superintendent is the official who should be responsible for all contact with the consumers from the point where an enquiry for service is received, whether by canvass, or direct enquiry through the post, telephone or showroom, to the time it becomes a definite job, whether chargeable or not to the consumer. This official is also in the unique position that he operates again *after* the work has been completed.

"Sales" means the sales of gas and by-products, and not merely of appliances, which are only a means to an end. Consumers who can be encouraged to use existing appliances mean just as much and possibly more to an undertaking than those who simply exchange one appliance for another. The Sales Superintendent should be directly interested in the price structure of the chief commodity sold—viz., gas; he should *sell* tariffs or anything similar. So many undertakings still think consumers *buy* gas and that it is not sold. Again one finds the sale of coke dealt with by an individual directly answerable to the Engineer. Coke is nearly as important as gas, and good coke sales mean good gas sales.

The Consumer Service Superintendent is probably the official who will deal most closely with consumers in their houses and other premises, and his contact must be flawless. Upon receipt of the order to deal with a certain job he makes contact, and until that job is completed to the satisfaction of the consumer he is the positive representative of the undertaking. When at later stages he services the appliances or repairs or renews parts or the whole, he again makes contact. He (or his staff) may be the only representative that the consumer meets, and to all intents and purposes he *is* the undertaking.

Here again records are important, and there should be available complete details of appliances, &c., on each set of premises, with dates of installation, whether purchased or on hire, with dates, &c., of repairs and of routine maintenance visits. He should plan his maintenance programme, and have adequate qualified staff for this purpose. The war has taught us a lot about the value of women as maintenance fitters, and many housewives feel a kind of kinship when one calls for routine inspection work, &c.

Advertising and Publicity

From the Sales Superintendent I would delineate advertising and publicity. The official in charge of the latter must work very much in conjunction with the sales side, and it would be difficult to place such control elsewhere. Advertising and publicity is not restricted to newspapers and posters; it must embrace lectures in schools, talks to clubs, and the activities of the Women's Gas Council. Interest in the general working of the undertaking as distinct from knowledge of modern appliances must be fostered.

Area Managers are the co-ordinators of the districts, and their job is one requiring considerable tact and initiative. They must of necessity maintain contacts throughout the area over which they preside, and they must also understand all the activities of the undertaking, so that they can ensure that the right official is cognizant with local problems which require attention.

I come now to that executive of whom I have very personal knowledge, and that is the Secretary. If I say he is important I hope you will agree, as he maintains a definite link between all departments. Through the Accountant, he is the source of all figures and statistics, and by his aid other executives can obtain considerable assistance and guidance. Without figures and arithmetical results it is impossible to measure efficiency.

Co-operation of all staff must be existent if an undertaking is to be successfully conducted. The General Manager alone can do little without loyal and efficient staff, and he must to a large extent rely on their personal work, investigations and reports. Only on consideration of the facts as presented to him can he be expected to conduct the business according to the policy laid down by his Directors or Council. By his experience and personal qualifications he will be in a position to consider important matters in an unbiased frame of mind; he can balance the over enthusiastic requirements of the Engineer with the sober facts placed before him by the Secretary. He is the best placed to visualize the undertaking as a whole. To do this he must have reports, whether verbal or written, and such reports must give the facts.

Clear and Concise Reports

The preparation of statements and reports for management purposes is a subject which has received scant consideration in the past. In order that the recipient of a report is in a position readily to understand the purport of the contents, the layout, in addition to the phraseology, must be clear and concise. Many executives imagine that unless a report is voluminous, and any statements or statistics which are given are numerous and elaborate, the report does not show how much work they have put into its preparation. It is surprising also that the General Manager and the Directors often measure the amount of work by the length of a report, but unless they are very meticulous and painstaking, I doubt whether they have the time or the opportunity to assimilate all the details submitted to them. A report and any statements which would support the reasoning outlined in it should be as concise as possible. It should start with the terms of reference clearly defined, so that what follows can only relate to the matters which have been dealt with. This should be followed by facts and details that have been found. Assumptions must be clearly stated, and conclusions should be stated either as a finding of fact or opinion based on the written assumptions. If a recommendation of some action is to be made, care should be taken to see that if such recommendation is challenged in any way, answers and reasons are known for any points which are disputed or queried.

Statements are always prepared to show a result, and if this result is obscured by a mass of irrelevant detail, the whole purpose of the statement may be lost. I have in mind the submission of statements showing various costs of processes or jobs or other routine matters. If a total cost is required it is better to show the main headings of the items making up the total rather than a number of subsidiary headings. Later, if the figures given are insufficient, it is a simple matter to elaborate the details, but the preparation of a mass of details in advance means in many cases a waste of time.

Regular Statements

The value of regular periodical statements must be considered. It is necessary for certain information to flow through at regular periods in order that the activities of the undertaking can be scrutinized, but such statements should be kept to a minimum. These statements, by the mere fact of their regularity, become so much part of the routine that often they are not examined with that degree of care which is necessary if the full value of such statements is to be obtained. It is better for special reports and statements to be made at irregular periods as and when time is available thoroughly to consider the contents of such documents. If as a result of the examination certain action is proposed for the future, and arrangements made for such procedure to be adopted, a further report and/or statements should be called for at the end of a period, giving the results of the amended procedure, and by comparing the details and the results shown in the original report and those shown in the subsequent one, the value of the amended procedure can be appreciated. Cost statements should be prepared in the first place with as much detail as possible so that every part can be appreciated from the cost point of view. When a further statement is prepared at the end of a certain period again full details should be shown, and the results can be dissected down to any heading which is shown on both statements.

I have mentioned that statements should be made as concise as possible. I would recommend the use of graphs and charts which present at a glance what may be equivalent to several pages of written

matter. The study of graphs and charts is something with which I cannot deal in detail in this Paper, but I do feel that the various well-known means of preparing such graphical records can be extended by use of a little ingenuity. One particular chart which I have not met to a great extent in the Gas Industry is that which is known as the "Gantt" chart, and to me this is one of the easiest methods of controlling the work of any individual, or any machine, or if necessary, any group of plant. I have seen some graphs which have so many hieroglyphics on them that it requires a decoding statement to be attached.

Time-Saving Equipment

The work of administrative control can be lightened in many ways by the use of time-saving equipment and the careful selection of staff. Scant attention has been paid in the past to the lay-out of the offices and the conditions under which work has been carried out. It has been the feeling in many undertakings that money spent on office equipment, including furniture and the enlargement of the offices themselves, is a cost which is unproductive, but I am pleased to see that the Gas Industry is now giving proper attention to the lay-out of offices and mechanical aids to the clerical staff.

Offices should be as large as is compatible with the size of staff, and good lighting and well-ventilated premises will more than pay for any cost involved. The dirty offices in which clerks are allowed to carry on untidy habits make for untidy work, and in the long run this must mean unreliable work. It is a simple matter to keep offices tidy, and it is a simple matter to make even cheap arrangements for the proper permanent or temporary storage of papers in the office.

In regard to mechanical aids, my mind goes to the machines which are used for the various accounting purposes, and I would like to give you a word of warning based on bitter experience, not only in the Gas Industry, but outside, and that is, if you ever have to consider the installation of mechanized accounting, do obtain the machine which is capable of dealing with the system as you require it. Many executives make the mistake of adapting a system to a particular machine, and it is only later that they find that the results which are obtained do not give them the full facts as they had desired the system to provide. The various machines of which I have had personal experience can be adapted to suit practically all the purposes likely to be required of them.

Any account submitted to an outside person such as a consumer must be prepared in such a manner that it is easily understood, and the facts or figures should not be obscured by a lot of irrelevant detail. I have in mind gas accounts prepared on machines which have to use code numbers, and the design of a bill which allows the consumer to readily translate the code is very difficult. Often the consumer must turn over the account to find the necessary information. Again, while appreciating the advertising space which can be available on a gas account, I feel that sometimes the gas accounts which I have seen represent more a pamphlet for the description of a cooker than the clear statement of the amount which is due by the consumer and the details making it up. I would like to mention the value which can be obtained by careful designing of forms, and in such designing if one carefully considers the staff which is likely to handle the form, and the order in which it is handled, the design can materially assist the carrying out of their work.

Punched Card Equipment

Another well-known machine is that which uses punched card equipment. Information which is put on to a card can be sorted and tabulated in any order required. The information, which is practically always in the form of figures, although printing can be introduced, means that certain parts of the information must be coded, but the question of codes must not be confused with my remarks on the use of codes where consumers are concerned. The code for the punched card system is for internal use only, and any statement based on the figures provided by the machine can be typewritten, giving the full description, &c., in ordinary words.

Just prior to the war the large company with which I was connected introduced an ingenious method of allocating and controlling district work. By the use of punched card equipment helpful information was quickly available for programming work for ensuing periods.

Every known type of job was listed and coded, and each was assessed in the number of units of work likely to be entailed in its completion. A unit was five minutes. The running of the supply for and the fixing of a fire at hearth was counted as 36 units. As every definite job was received from a consumer a job number was allocated and units of work were calculated. These jobs were then totalled according to the district in which the work was to be carried out. The whole area was divided into a number of districts, and it was therefore known on a Saturday morning the total number of work units for each district. The number of fitters employed was in the region of 2–300, and accordingly by estimating the number of fitters required for each district so they were allocated. Thus district No. 1 may have required for the following week 30 fitters, while district No. 2 may have required only 10. Any urgent work could be easily controlled, as it was known where there was surplus fitter-labour. The work units of the individual jobs were carefully watched, and while a printed list of jobs was made it was elastic, so that if it was found that certain types of jobs were taking more or less work units, the number was increased or decreased accordingly.

American Methods

In regard to matters of administrative control and the wider aspects of management, some of you may be interested in the study of American methods. A number of people who have studied American methods appear to be over-enthusiastic in regard to the comparison between these and what are found in many up-to-date industrial undertakings in this country. As a young and progressive country their ideas are certainly worth consideration, but their outlook is based on short term policy as distinct from a long term. They are more apt to realize the immediate benefits of an alteration in equipment or method than we are, and often by their policy they are able to deal with immediate problems far more quickly, but for stability and permanency of results there is little that America can teach us.

With the grouping of undertakings into regions there will be every possibility for those in control to install and work the most modern systems in regard to internal organization, and further to increase the availability of expert knowledge in matters affecting manufacture, distribution, sales, &c. While many have mixed feelings on the question of regionalization, provided those in administrative control are wisely chosen, there should be many opportunities for improving internal reorganization within the Gas Industry.

DISCUSSION

The **President** (Mr. C. A. Newham, Leeds) said the Paper dealt with a phase of Gas Industry affairs which did not normally come within the Yorkshire Junior Gas Association's range, but it was a side of the Industry which vitally affected them all, and one which none of them could afford to neglect. Not all members of the Junior Associations had many opportunities on their own undertakings, and it was desirable that an occasional insight into the administrative side should be given. What would happen to them in the future in regard to responsibilities they could not say, but as they were placed at present it was clear that on a lot of their jobs the ideas as set out by Mr. Allum were admirable. A Works Manager's job was likely to become more and more confined to two main things—labour and keeping contact with possible developments to get the most out of his plant—and that did not leave the Manager much time to get down to administrative detail, and he must delegate much departmental detail to capable staff. The meeting would appreciate a little more information about the Gantt chart for programming work, and would like to know whether Mr. Allum had any ideas as to standardizing the type of units on which one could base works costings. They in the Gas Industry used to talk in terms of units of candle-power. That had grown into therms, and now they had a lot of Continental information coming to them, and then of course they had the percentage basis, and they seemed to need about three account books. One would like to see some standardized basis.

Mr. **Allum,** replying, described the Gantt chart, and said he applied it himself for clerical labour and for the work of accounting machines, and he considered it could be usefully applied to programming any process on the works. For a department with only two or three people it might not be worth while, but the system was well worth while where there was any appreciable number of people or of machines. From time to time one worked out how much time was taken on the jobs concerned, and it was kept constantly up to date by recording temporarily in pencil. Thus they could know how the work was spread over the days, weeks or months, and one could know how one might approach any extension of the work in prospect. In regard to standardization, he would give a word of warning. If they attempted to standardize everything they were asking for trouble. Local conditions might make a difference, but where it was possible to standardize in Gas Industry administration he felt they should be given a lead from the highest quarters—perhaps from a committee to advise on standardization throughout the Industry.

Mr. **Taylor** (Bradford) appreciated the value of Mr. Allum's suggestions, but noted what appeared to him to be a somewhat grave omission in that there was no mention of the industrial sales side as distinct from the sales side in general. It would appear that under Mr. Allum's proposals the administration of the industrial sales section would come under the general Sales Superintendent, but in an undertaking which had a substantial industrial side there ought to be adequate recognition of separate control, though he agreed it must be in liaison with the general sales side.

Mr. **Allum** said he entirely agreed. It was not a deliberate omission, but merely that he could not go into every detail. The industrial sales side, where it was reasonably substantial, should come under an Industrial Sales Superintendent, who should be answerable to the general Sales Manager or Superintendent. Under the Industrial Sales Superintendent, or very near to him, was the research office or industrial testing station. Everything under industrial sales should be under an expert in industrial needs and not the domestic sales department.

Mr. **D. C. Henderson** (Bradford) asked what would Mr. Allum suggest as a suitable period for conferences of departmental heads on general policy and relationships between departments? Would he suggest they be every month, every quarter, or only occasional?

Mr. **Allum** said he did not believe in planning a regular meeting of that kind, because on many of the fixed dates there might be no real need for a consultation.

Further Distribution at Tottenham

(*Concluded from p. 355*)

Mr. **E. O. Rose** (Tottenham and District Gas Company), replying to the discussion on the Paper on "Further Distribution at Tottenham" which he presented at a meeting of the London and Southern District Junior Gas Association on Feb. 8 (see "JOURNAL," pp. 313 and 352), noted Mr. Escreet's approval of the Lacey formula. He said that when, in 1928, he first used it he found it too complicated for ready use and designed the charts to save himself trouble. It had been suggested that he should have given the whole charts instead of sections only. Had he done this the scale in the reproduction would have been too small; besides, he had realized that the charts, if reproduced in full, had a cash value. Mr. Escreet had raised the question of a 12-in. main versus a 10-in. main between Ponders End and Waltham, and Mr. Deas had also mentioned this. Mr. Rose admitted that he now wished it had been a 12-in. main or, better still, 14 in., but it had to be remembered that the work was done in 1928 before widespread amalgamations were thought of. Furthermore, there was a Board of Directors with a financial policy that had some say in the matter, and at that time the general trend was against heavy capital expenditure. There was an old-established rule in the Gas Industry that capital expenditure should not exceed £500 per million per annum. A number of people had raised the question of vents to governors supplying the smaller isolated districts. It was found that in the small rural areas the gas consumption at night was *nil*, and the governor was then liable to blow. The governors at Wormley and Rye Park were of the Peebles type, and supplied areas mainly urban. In such locations there was always a fair consumption, and the governors worked quite satisfactorily up to 5 lb. per sq. in. At Great and Little Wymondley they put in 4-in. Peebles mercurial governors, and these were found to blow at night, because there was absolutely no consumption. The solution had been to install a free public lamp in each village. With Jeavons high-pressure governors there was no letting by at night. At Clifton they tried to interest the local authority in public lighting, but they would not have it. One interested gentleman, however, agreed to pay for the installation of one public lamp to show the village what could be done by gas, and this solved their problem. Mr. Escreet had mentioned the size of the main at Hitchin. They could have had lower pressure and a larger main, but this would have meant the relaying of some seven miles of existing 3-in. main. This would greatly have increased the capital expenditure, and they therefore decided to go for the higher pressure.

Pressure Reduction

Reference had been made to the 10 lb. reduction of pressure at Hitchin. That was worked out initially on theoretical considerations. The gas was dried before entering the compressor, but when it was compressed it was saturated again. They therefore passed the gas into a reservoir, which also acted as a cooler. Necessity had since forced them to abandon this practice and deliver at compression pressure direct to the main. There had been very little increase in the water deposited in the main. Questions had been asked about the 3-in. main to Shefford, laid without syphons, and Mr. Escreet had raised the question of cost. He recalled that this was the cheapest main they had laid. It cost under £600 a mile, and was laid at the rate of three-quarters of a mile a week. It was laid along the side of a country road, and in many places it was actually about 2 ft. above the level of the roadway. If they had allowed for future road widening and laid the main 2 ft. 6 in. below road level it would have meant putting it 4 ft. 6 in. deep in most places. In practice they had saved a lot of excavation, and quite a lot of money. They had never had any liquor in it. Water could not normally get into it from outside because the main was under pressure. If water did get in, it would be blown right through.

Mr. Escreet had also raised the question of the organization of the mains department and its emergency work. The mains department was part of the engineering department, and formed part of his own department, which covered all constructional work, whether for production or distribution. The responsibility went as far as the point where the service left the main. The mains department and the "distribution" department had to work in together. In connexion with new housing estates, for example, the mains department frequently laid the services because there were not enough service men to do the work. Emergency work was taken by the "distribution" department first, and ordinary escapes were dealt with by the service layers, because the escapes usually occurred on the services. If the service layers found the escape was due to a faulty main they either repaired it (if the job was a simple one) or handed the work over to the mains department.

Protection of Steel Pipes

Reference had been made by Colonel Gould to steel pipes and the need for protection against corrosion. The precaution they took at Tottenham, beyond double hessian wrapping and bitumen coating, was to make the main electrically continuous. They drove down lengths of steel angle iron at intervals, and welded these to the main so that it was thoroughly earthed. In that way they had avoided any corrosion. They were lucky not to have had to run their main alongside an electrified railway. Most of their steel mains were in country areas, where they never really needed to get right on top of cables. On the whole they had had very little trouble with corrosion in steel mains. Cast-iron mains had been mentioned. They had recently laid such a main with the Stanton-Wilson joint, and tested it at 80 lb. per sq. in. pressure, but they did not intend to operate it at a pressure above 25 lb. per sq. in. They were as yet doubtful of trusting the joints for continuous working at higher pressures. They had also used the Staveley joint, and there was not a great deal of difference. They also used Johnson couplings in special cases, and Victaulic joints in others. The Victaulic joint was a very good one, and had been used recently in laying a new high-pressure water main for their Water Undertaking at Dunstable. In answer to Colonel Gould, they had had quite a lot of dust in high-pressure mains, and some of their valves had become clogged. Wherever possible they had taken out gate valves and put in Audco cocks, which would cut through the dust. Relative merits of different formulæ had been discussed, but he still felt that the Lacey formula was the most exact. It was a little bit awkward to use, without the aid of charts, but most of the other formulæ were based upon assumptions that limited their legitimate field of application and were therefore apt to lead one astray.

They had had troubles arising from the freezing of holders. Most of their stations were isolated, but they had one man living on each station, and when necessary he started up the anti-freeze boiler. Regarding consumers' maximum demand, in the Sewardstone Road area the demand was about 25 cu.ft. per consumer of 500 B.Th.U. gas. The area included some large houses and a number of small cottages, but they generally found the average worked out at 25 cu.ft. He had been asked whether their original estimate of a demand three times as great as at present still held good. They wished now that they had made it more; they had exceeded that estimate in a good many cases. He had further been asked what they were doing now by way of forecasting. In these days everything was planned for them. They had only to refer to the Abercrombie Report. This specified the number of people who would be allowed to live in any district. They were allowing for saturation to those figures, bearing in mind that every domestic consumer brought with him his share of commercial and industrial load.

On the motion of Mr. **E. F. Bradley**, seconded by Mr. **J. E. Gray**, a hearty vote of thanks was accorded to Mr. Rose for his Paper.

Author's Written Reply

Mr. **Rose** has since submitted the following written reply to further points raised in the discussion. Mr. Escreet has asked for details of the saving in cost resulting from the laying of small high-pressure mains without syphons. It should be understood that the saving is due to the fact that such mains can be laid, in rural areas, in banks and verges, the levels of which frequently rise or fall above or below the road level. A main laid to falls under such conditions must, at many places, lie at a considerable depth. If syphons and falls are abandoned the main can follow the levels of the surface at a regular depth of, say, 18 in. The main in question was laid in 1935 by contract and the schedule of prices was as follows:—

	s.	d.	
3-in. laying in grass verge at 18-in. cover	1	6½	per yard.
3-in. joints	2	0	each.
3-in. extra depth per inch above 18-in. cover		¾	per yard.

The basic cost of laying per yard was therefore:—

	s.	d.
Pipes at 1s. 4d. per ft.	4	0
Laying	1	6½
Jointing—one joint per 16-yds. average		1½
	5	8

Each additional foot of cover cost 9d. per yard, and a main laid in a verge, the level of which was 2 ft. above road level, would have had to be laid at 4 ft. 6 in. depth to allow for field entrances, &c., and the extra cost of excavation would have been 2s. 3d. per yard, or 40% on the basic cost. It is not the Tottenham Company's practice to lay H.P. mains without syphons at distances of less than 2 or 3 miles from the compressing plant.

Col. Gould mentioned the difficulty of lowering such a main as this, and questioned whether any saving gained initially might not be absorbed by the cost of later lowerings. It must be emphasized that this practice is recommended only for rural areas, where development is not expected. In a period of 11 years it has only been necessary to make one such lowering (to pass under a carriage drive), and this was carried out at very little cost. Other mains, across open fields, have also been laid without syphons.

Col. Gould referred to both the Weymouth and Cox's formulæ. Both these are simpler of application than Lacey's formula, as they avoid the use of the variable coefficient of friction. This coefficient has been determined experimentally, and Lacey gives its value against corresponding values of Reynolds criterion, which is $\frac{17.7Q}{d}$.

The coefficient makes the Lacey formula incapable of direct solution, and it was to overcome this difficulty that the Author designed his charts. Cox, Weymouth and many others overcome the same difficulty by the much simpler process of ignoring it and they take a fixed value for the coefficient. The results obtained can therefore only be correct over a limited range, and the Author strongly deprecates the general use of formulæ which are known to be accurate only within certain limiting values.

High-Pressure Storage

Col. Gould also mentioned the high-pressure storage stations constructed by his Company. A study of these was made when the Tottenham Company embarked upon a similar project. The plant described by the Author is, of course, much smaller, and the main objective in the design was to reduce the amount of automatic gear to an absolute minimum. This could not have been done had not the public electricity supply been available.

The Author apologizes for the use of the term "Duplex" in connection with the Reynolds district governor. This is an error. The governor is a single stage governor, loaded by a diaphragm and controlled by two pilot governors. Mobile vacuum plants contained in light vans are used for service clearing, though these are not operated by the mains department. They have been used for syphon pumping, but a plant with a larger tank capacity is now contemplated. It is found that syphon pumping is only required on the syphons immediately following a compression station, and in cases of broken mains and under such conditions the quantity of liquor to be removed often exceeds the capacity of the small mobile plants.

Mr. Masters has asked for particulars of the testing of H.P. mains. These mains are first tested in short lengths before the joints are covered and a final test is put on the finished main. A pressure recorder is attached to the main, and the pressure is raised to 100 lb. per sq. in. by means of a portable compressor. After a small initial drop, due to cooling, the main is left for three days. A loss of only 2 lb. in this period would be regarded as a good result on a welded main, and a main with a drop up to 4 or 5 lb. would be passed.

Mr. Fuller Peterson has remarked upon the method of connexion of the back-pressure valve at Hoddesdon. The difficulty pointed out by Mr. Peterson did actually arise, and the valve is now connected directly to the holder outlet. In this position it derives its supply from one holder only. No special cooler is employed at the Hitchin compressing station, though two small tanks are used as receivers. All compressing plants, whether on the 5-lb. or 40-lb. systems, are fitted with automatic relief valves, returning to the inlet, which will operate in the case of governors or valves being closed against the compressors.

Mr. Peterson is very fortunate in having been able to purchase a mechanical excavator recently. The Author's experience has been that British makers require at least 12 months for delivery and that, although there are a number of excellent American machines in the country, they cannot be released at the present time.

Wartime Measures

Mr. Richbell has referred to war-time measures. The Author had tried to say as little as possible about emergency arrangements. At Tottenham we completely valved our high-pressure system and commenced a scheme for segregating all low-pressure mains of 10 in. dia. and upwards. This was not started until after the 1940–41 blitz, and we were not able to get very far with it.

The Author is sorry that he did not include a map of the whole of the Tottenham Company's area, but the number of illustrations mounted up and something had to be left out. The purpose of the Paper was more to give a selection of typical problems than to present a complete survey.

Mr. Richbell mentioned the use of Post Office lines for recording purposes. Circuits rented from the G.P.O. pass from point to point through their multicore cables, and it is quite easy for a circuit to be interrupted unintentionally by anyone working on the lines. Such an interruption has often shown a zero reading on the recorder, and an electrician has been sent to the transmitting end in search of a fault, but all to no purpose. The use of private lines avoids such troubles as these.

Both Mr. Clarke and Mr. Deas have shown astonishment at the cost of 1s. per 1,000 lb. given for steam. This was in 1928, when steam costs worked out roughly at 1s. per 1,000 lb. production cost and 6d. per 1,000 lb. capital cost on 100% load factor. In the particular case of Ponders End in 1928, idle boilers were available and no capital expenditure was necessary. In subsequent projects steam was charged at 1s. 6d. per 1,000 lb. on 100% load factor and more if the load factor was less. Mr. Deas has raised the whole question of steam for boosting, and commented on the uneven load it throws on the boiler plant installed at any manufacturing station from which gas is boosted direct to the consumer. The Author inclines to the view that the power required for boosting should be kept separate from that required for manufacture. Steam is most unsuited to so widely variable a load and public electricity supply is out of the question, as an unforeseen stoppage, of however short duration, cannot be allowed. Internal combustion engines, in themselves alone, are incapable of giving the wide speed variation required, but it is considered that there are definite possibilities in the use of a diesel-electric or gas-electric system, employing a Ward-Leonard transmission. This matter is being actively pursued at the present time in connection with future extensions.

Mr. Clarke criticized the uneconomical use of power in the compression of gas on the Biggleswade system and elsewhere, and asked why small local compressors had not been used at the high-pressure holder stations. He is probably correct on this point, but the most economical system is not necessarily that which uses the least amount of power. There is the cost of maintenance and supervision to be taken into account. Many of the units described in the Paper are small and the power consumed is not great. The one point that has been kept most in mind during all the developments described is simplicity of operation with the minimum of supervision and maintenance, and power has often been sacrificed to achieve this end.

Mr. Shann is correct in assuming that either of the two compressors at Ponders End were originally installed to carry the whole load, and he suggested that three smaller units might have been more satisfactory. This practice is being followed where larger units are involved, but the size of the plant at Ponders End hardly warranted subdivision. The Author has no regrets on this account, as at the present time it is necessary to run both compressors together for some eight hours each day. Fortunately the engines originally fitted will develop the power to produce a pressure of 5 lb. per sq. in., and the effective bore of the main has been increased by the use of the 8-in. dia. loop shown in fig. 1.

Dry Dust in H.P. Mains

Mr. Warne mentioned rust troubles. A dry dust was formed in all H.P. mains, and where high velocities were used this was carried forward and lodged in valves, governors, and even consumers' meters. Syphons acted as excellent traps and dip pipes became choked. They were now made removable. Special syphons, designed to act as interceptors, with a removable dust basket, have been employed, and in one case a cyclone has been used. The Author has not felt that he could trust screens or filters for the reason that if they were to be effective they would soon obstruct the flow of gas. C.I. pipes were laid uncoated, but steel mains only had a coating of boiled oil on the inside. This was intended to protect them before being laid.

Mr. Warne also asked for costs of pipe transport. The cost of 8-in. pipes to Ware by barge was 1½d. per yard more than the f.o.r. cost at the nearest railway station, and the cost of road transport from the station, had it been possible, would have been 8d. per yard. The cost of 12-in. pipes delivered along the railway by special train worked out at about 10d. per yard compared with road transport at 1s. 4d. per yard.

A number of people raised questions on governors, and there appears to be some confusion on account of the different pressure ranges employed. The following is a summary of the types at present favoured:

A. 40 *lb. per sq. in. system* (minimum 2 lb. per sq. in.).
For services: Jeavons J.103 and J.106.
For district governors: Reynolds district governor, Jeavons balanced valve, Jeavons J.111.

B. 5 *lb. per sq. in. system with drop at night to* 6 *in.* W.G.
For services: Jeavons, Hilo.
For district governors: Urban areas not requiring lock-up—Peebles mercurial.
Rural areas liable to no load conditions—Jeavons balanced valve.

C. 1 *lb. per sq. in. system* (minimum 7 in. W.G.).
District governors: Peebles mercurial.

D. *Supply mains fed by automatic boosters* (45 in. max.–6 in. min.).
Service governors: Newbridge (piston type).

All H.P. service governors are inspected and cleaned once a year.

Mr. King has raised a question which, though scarcely one of distribution, is of prime importance to the good name of the Industry. That is the matter of constancy of combustion characteristics. With a number of manufacturing stations passing gas into a common system uniformity in this respect is most desirable. The Heyworth report proposes the statutory control of specific gravity within certain limits. It is no doubt intended that this should establish some degree of uniformity, but the proposed prescription alone would not be sufficient to satisfy the needs of many of the consumers using specialized plant.

It would be quite possible, given the right proportioning of plant at each manufacturing station, to control the variations in combustion characteristics within reasonable limits under most conditions of load. Few undertakings, however, can at the moment have such surplus plant as to make such control immediately possible.

COMPANY MEETINGS

South Metropolitan Gas Company

THE Ordinary General Meeting of the South Metropolitan Gas Company was held at the Livesey Institute, Old Kent Road, on Feb. 27, Mr. Frank H. Jones, M.Inst.C.E., the President, presiding.

In the course of his statement, which had been circulated with the report and accounts, the **President** said: It was not until Mar. 5, last year, that the last flying bomb fell on our area, and it was not until Mar. 26 that we had our last rocket. In these circumstances the figure of 5.25 as the percentage increase in the sales of gas for 1945 over the sales for 1944 needs amplification in order that you may realize the extent of the demands made upon us in the second half of the year. We felt almost immediately the effects of the capitulation of Germany, but earlier in the year we had felt also the reactions of flying bombs and rockets, and actually to the middle of August there was a decrease in our total sales compared with 1944, but from then onwards the increase mounted until for the second half of the year, the total increase was no less than 18.77%.

In the recent cold spells—not in themselves of abnormal severity—it has been necessary for us and others to reduce pressures in order that the supply to consumers should not fail. Reduction of pressure is a step which we take only with the greatest reluctance, for we realize that it may entail inconvenience to a number of our consumers; indeed, very rarely even during the war was pressure reduced save in small areas because of damage to mains; but the causes were altogether beyond our control. Through enemy action we lost a good deal of our storage, and, while repairs are being pushed forward, nearly a third of our holder capacity is still out of action; but our chief difficulty, on the works and in the distribution department, has been lack of labour. So long ago as last May the managers made urgent representations to the Government on this matter, and their entreaties were repeatedly renewed; but although we have had help from the Army and from Italian co-operators—help which we have appreciated—it has not fulfilled our need of men whom we can train for permanent work. Demands for gas reached on occasions 30 and even 40% above those for corresponding days of 1944. I think that in some ways this winter has been more difficult for the works even than the days of the war, and the manner in which they have faced their difficulties deserves the highest praise. I may add that, even on the most difficult days, the quality of the gas has not varied from our normal standards.

Revenue from Products

Coal has cost us more by £388,058 than in 1944. The difference is explained partly by the increased quantity used in 1945—912,729 tons, compared with 856,046 tons—but to a greater extent by the further rise of 3s. 6d. a ton in the price of coal—the twelfth since the outbreak of war—which took effect from May 1. This increase was offset to some degree by the increase permitted to us in the price of coke. Indeed, coke has provided a sum approximately equal to a third of our revenue from gas.

For repairs and maintenance of works and plant £732,406 is a large figure. We could not, however, have made it smaller consistently with our desire to make provision for deferred repairs; and I need hardly add that the proper maintenance of our plant has the first priority in our expenditure. The same applies to the distribution department, and our total provision for deferred repairs, for works and distribution, now amounts to £401,615.

War Damage

Another provision is a further £53,000 for our prospective liability for war damage contribution, bringing the total reserved under this heading to £159,000. It is not very satisfactory that in 1946 we should still be waiting for the introduction of legislation, promised in 1941, to deal with war damage suffered by public utility undertakings; but some movement at last can be discerned, and undertakings have recently been asked for their estimates of the damage they have suffered. A levy will presumably be made on all undertakings throughout the country, and the total damage suffered will be met partly from the proceeds of this levy and partly from moneys provided by the Government.

I should like to mention the most satisfactory arrangement which we have recently made with the London County Council. We have always contended that tenants should have the freedom to choose the form of heating and cooking they desire, and that provision to this effect should be made while a dwelling is under construction. The London County Council have adopted this point of view, and in all future permanent dwellings, whether on new estates or on estates partly developed before the war, we shall be given facilities for making an ample gas service available to any tenant who desires it. The Council's lead, I am happy to say, is being followed elsewhere, and, combined with the Council's readiness to collect standing charges and charges for the hire of appliances with the weekly rents, this provision should be of real benefit to the tenant, and therefore to the Company in the development of its business.

Gas for Industry

With regard to gas for industry, there was, of course, a large increase during the war, not only in the proportion sold for industrial purposes, reaching just over 20% of our total sales in 1942, but also in the actual quantity, the industrial sales for that year being the largest in our history. Since the cessation of hostilities there has naturally been a decrease in the proportion and in the quantity of industrial as compared with domestic sales; but the reduction has been very slight, and we hope to retain, and to expand, our business with many industrial concerns who turned to gas for their processes during the war. I believe that what has weighed largely with our customers is both the intrinsic merit of gas as an easily controlled and therefore economic fuel, and also the service that our industrial department, which is one of the country's 11 industrial gas centres, is also to provide in the design and servicing of apparatus. We are finding much interest being taken in infra-red heating for such processes as paint drying, and our industrial department has been prominent in the development of these processes.

After referring to nationalization and the Heyworth Report, the President continued: In the meantime we do not intend that, so far as lies in our power, developments which we had in mind before nationalization was mooted shall be deferred or even delayed. Your board have recently had before them a scheme for the construction of plant of the latest design in replacement of that which is nearing the end of its useful life. This scheme had taken months to prepare, and we did not hesitate to instruct the managers to proceed with it. This will be our policy in all sections, and not least in our research departments, for we are determined that, to the best of our ability, the interests of our consumers, present and future, shall not suffer by any interval of uncertainty.

Tribute to Employees

For many, if not all, sections of the company, the end of hostilities has brought little relief. I have indicated something of the demands made on the works during the last few months; for the district equally there has been the battle with increasing calls for supplies, and insufficient resources of labour and materials to meet them. The spirit of the men who went out to attend to damaged mains while a raid was at its height, and of the men who continued to charge the retorts with enemy aircraft overhead; the steadfastness of the control staffs, and the pluck of our girls who attended betimes in the morning, although their homes had been damaged in the night—this is the spirit which continues, and, although it may feel tired, cannot yet allow itself to rest. I am sure that to all you will wish to say, thank you for another year's good work.

The report and accounts were adopted; a final dividend of 2½% on the Ordinary stock, making 4% for the year, was declared; Mr. B. R. Green and Lieutenant-Colonel F. J. Bywater, M.C., M.Inst.C.E., were re-elected directors, and Mr. Bernard Hennell, F.C.A., was reappointed an auditor.

A vote of thanks was accorded to "everybody in the Company" for their services during the past year. Dr. E. V. Evans, Joint Managing Director, who responded, spoke of the difficulties that still lay ahead, but said he was confident they would win through.

Southampton Gaslight and Coke Company

The Annual Meeting of the Southampton Gaslight and Coke Company was held at the Company's offices, Southampton, on Feb. 26, Brigadier E. M. Jack (the Chairman) presiding.

The **Chairman**, in moving the adoption of the report and accounts, referred at the outset to the death of Mr. Thomas Carmichael, Deputy-Chairman, who was a Director for 16 years, and the meeting stood for a moment as a mark of respect.

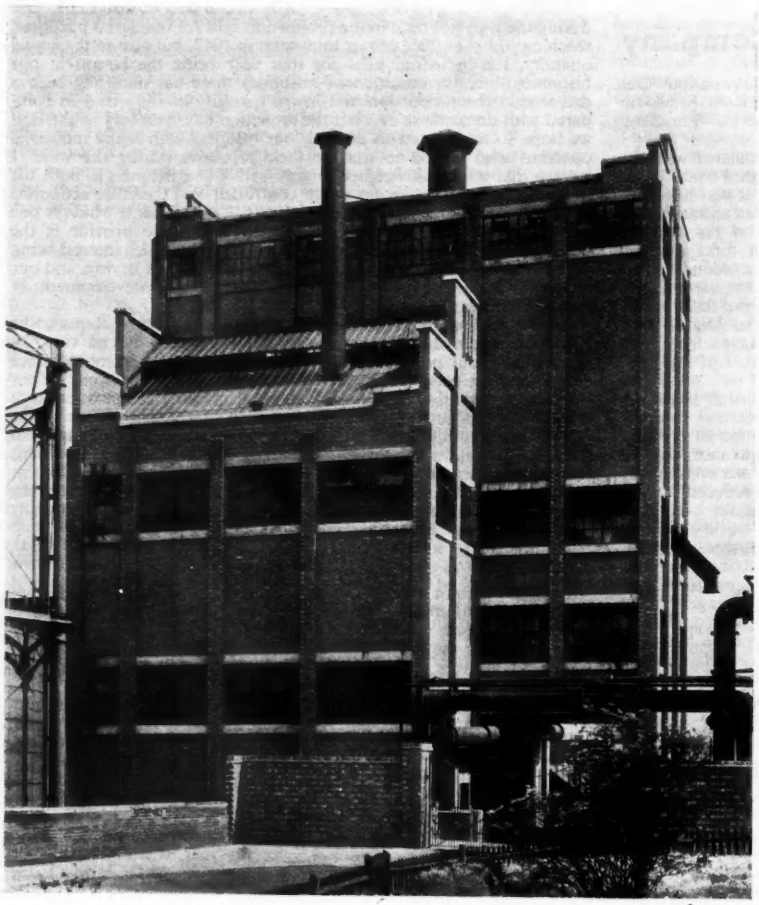
To succeed Mr. Carmichael the Directors had elected as Deputy-Chairman Mr. S. E. Whitehead, the Managing Director.

New Plant

For the first time for many years the capital account showed a substantial expenditure, the bulk of it being the first payments on account of the extension to the static retort plant. Considering the difficulties and delays which had arisen through shortage of labour and materials, the new plant was making satisfactory progress, and it was expected that it would be completed in time to assist with the peak of next winter's load.

Despite the many appeals for fuel economy the sales of gas again showed a large increase on the previous year's figures, the increase amounting to 193,817,900 cu.ft., or nearly 8%. It would not be right to ascribe that entirely to extravagance on the part of consumers. It was undoubtedly due very largely to the difficulty of obtaining enough solid fuel.

Coal prices had again advanced, and the cost of coal per ton compared with the 1938 price showed an increase of 140%. Supplies of coal were erratic in quantity and type, and its quality was steadily deteriorating. This was reflected in the quality of coke. An increase in wages in the Gas Industry in October last cost the Company about £15,000 a year.



GLOVER-WEST

Vertical Retorts

at

HIGH WYCOMBE

ARCHITECTURAL FEATURES

From the layman's point of view, perhaps the most interesting feature is the attempt to produce in an essentially industrial building a pleasing architectural appearance. The steel frame-work of the building has been encased in brickwork, and the coal-receiving annexe and coke hoppers are built as integral features of the main building. A liberal use has been made of steel-framed windows for producing maximum natural lighting and ventilation. Parapets with "Snowcrete" coping form a pleasing finish to the skyline. Rain-water pipes are not visible, being taken down internally. The full effect of the building when viewed from Desborough Road is masked to some extent by the abutment of the old horizontal retort house, but when this is dismantled and the new retort house extended it will appear as an independent and symmetrically designed structure.

WEST'S

GAS IMPROVEMENT CO., LTD.

Miles Platting, MANCHESTER 10

Telephone: Collyhurst 2961-2-3-4-5.
Telegrams: Stoker, Manchester.

London Office: Columbia House, Aldwych, W.C. 2.

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COMPANY MEETINGS—cont.

Supply Maintained

During the very cold weather experienced in January the plant at both works was stretched to its utmost limits, and the staff had an anxious and trying time. The supply of gas was maintained all through the cold weather, and thanks were due to the staff and workmen for their good work.

The labour situation continued to be difficult, particularly as regards gasfitters, and the supply of appliances from the makers was still inadequate. The result had been considerable delay in some cases in attending to consumers' orders and complaints. Every effort was being made to carry out orders as promptly as possible, but it was impossible to give every order the prompt attention it obtained in pre-war days.

Men Required

A number of younger able-bodied men were required at the works to enable the Company to retire many employees who were well over the retiring age of 65. It had been a source of great gratification to the Directors to note the splendid way in which many of these men, who would have preferred to retire, had stood by the Company and carried on.

Referring to the Heyworth Report, the Chairman said the Industry strongly disagreed with the recommendation for compulsory purchase, and with many other points in the report. The present Government had not yet adopted the report, but were pledged to nationalization, and had notified the Industry that the question was not open to discussion.

Mr. **S. E. Whitehead**, seconding the adoption of the report, said 1945 had been a most difficult year, and the satisfactory results obtained reflected great credit on the staff and employees. So far they had had to restrict their efforts to essential repairs, with the result that the works appeared somewhat dilapidated, but the operations of gas and coke production were carried out as efficiently as before the war. For example, the thermal efficiency of the Southampton works during 1945 was 74.6%—a very satisfactory figure. They were proud of this, and also of the fact that since the outbreak of the war the quality of gas supplied was maintained at or above the statutory calorific value—at Southampton with the sole exception of a part of the period 1940–41, the result of enemy action, and at Winchester during the whole period of the war. The provision of a supply to new houses was keeping the Company busy, and gas services and points were to be installed in the permanent houses now being begun by the Southampton, Winchester, and Eastleigh Corporations, and by the Winchester and New Forest Rural District Councils. With regard to temporary houses, the Government's original suggestion was that half should be equipped for gas cooking, laundry and refrigeration, and the other half for electricity. As a result of representations to the Ministry the instruction was modified, and two-thirds of Southampton's prefabricated houses and the whole of those to be erected in Eastleigh and the New Forest area were to have gas supplies.

The report and accounts were adopted.

Messrs. Burnett, Swayne and Stothert were re-elected auditors.

Proposing a vote of thanks to the officials and staff for their excellent work during the year, Alderman Woolley said they were fortunate in having officials and staff who were both loyal and competent.

Mr. H. Runham (Secretary and Accountant) and Mr. G. Neil Engineer) acknowledged the vote.

Gas Undertakings' Results

Alliance and Dublin Consumers' Gas Company.—The report and accounts for the half-year ended Dec. 31 show a surplus on revenue account of £62,385, and the Directors recommend a Consolidated Ordinary dividend at the rate of 4%, against 3% for the previous half-year, and 2% for the December half-year, 1944. Despite the limitations which have existed with regard to the price of gas, substantial improvement has been made in the Company's affairs since the Board was reconstituted in March, 1943. At the end of 1942 there had been a loss on revenue account of £63,895, and no dividend was declared. In the three years since that date the Company has earned profits of £337,342, resumed and increased progressively the payment of dividends, and paid off a bank overdraft of £205,000. These results have been achieved in the face of exceptional difficulties and substantial increases in operating costs, and have been possible only by strict economy and the introduction of technical and other improvements.

Commercial Gas Company.—The revenue account shows a profit for 1945 of £83,483, against £42,443 for the previous year, and after providing for debenture and other interest, less credit, and provisions for war damage contribution and deferred repairs, there is a balance of £30,219 available for dividends. The improvement in the affairs of the Company has resulted in an Ordinary dividend of 2%, which, with Preference dividend at standard rates, absorbs £20,281, leaving £9,938 to be carried forward. A deficiency of £367,810 as at Jan. 1, 1945, together with additional charges, less credits, relating to the war period, has been carried forward in the balance-sheet under the heading of net revenue deficiency suspense account. Manufacture of gas at the Stepney works was discontinued in October, all gas manufacture now being concentrated at the Poplar works. Gas sales totalled 8,427,070 therms, and yielded £515,906, compared with £495,169 for 1944.

Cork Gas Consumers' Company.—Revenue profit for 1945 was £14,236, and after bringing in a credit of £285 from 1944, providing £4,000 for depreciation and paying an interim dividend of 3%, which absorbed £2,740, the balance of profits amounted to £3,410. A final dividend of 3%, making 6% for the year, leaves £669 to be carried forward. Presiding at the 153rd ordinary meeting on Feb. 27, Mr. E. T. Mahony said the Directors were giving consideration to the increased demand for gas which would follow completion of the many projected building schemes in the City, and as this would necessitate considerable capital expenditure they had retained the services of a well-known consultant gas engineer from London to advise on these matters. Among the projects in view were the installation of a carburetted water gas plant, a new governor house, extension to boiler plant, and a comprehensive reconstruction of distribution arrangements by a system of high-pressure mains.

East Hull Gas Company.—The revenue account shows a profit on the year's working of £27,888, compared with £25,413 for the previous year, and a dividend of 5% has been declared, leaving £1,191 to be carried forward to the next account. Capital expenditure during 1945 on new mains, meters, and stoves, after deduction of sundry credits for depreciation, &c., amounted to £2,874. Gas sales, which yielded £113,715, amounted to 2,336,112 therms, compared with 1,917,664 therms (£93,377) for 1944.

Grantham Gas Company.—At the annual meeting, the Chairman, Dr. G. A. C. Shipman, said that last year the sales of gas beat all previous records. This year they were installing additional retorts, and providing new and larger exhausting machinery. A long-term policy in anticipation of still further demands was under consideration. The nationalization cloud which had replaced the war cloud, however, made all planning difficult and unreal. There had been a material increase of revenue, with the usual offset of a corresponding increase in expenditure on account of rising costs of material and labour. A dividend of 5½%, less tax, making 8% for the year, was declared.

Isle of Thanet Gas Light and Coke Company.—Gas sales in 1945 showed a substantial recovery from the effects of the war, and totalled 292 million cu.ft., as compared with 174 million in 1944 and 489 million for the year 1938. The balance of net profit for the year, after providing for debenture and other interest on loans, interim dividend and fixed charges, amounted to £2,648. A final dividend of 2½% makes 5% for the year.

Wisbech Lighting Company.—At the 134th general meeting of the Wisbech Lighting Company, the Chairman (Mr. G. S. Gardiner) reported that in spite of the greatly increased demand and considerable difficulties supplies had been maintained during the year. The report showed that the net profit for the half year ended Dec. 31, was £3,322, and after appropriating £297 to the renewal fund, the credit balance of profit and loss account was £4,667. The directors recommended the following dividends: Ordinary stock (£3 certificates), 11% per annum; ordinary £5 shares, 10% per annum (less tax). The cost of manufacture of gas was £21,900 (including £15,949 for coal), distribution cost £1,237, rent, rates and taxes £1,949, management and administration £1,777, and miscellaneous expenses £662. The sale of gas produced £21,465, residual products £8,308, and miscellaneous income £1,373. The output of gas reached 170 million cu.ft. as against 116 millions in 1938, an increase of 44%.

Woking District Gas Company.—The balance carried to net revenue account for 1945 was £18,661 compared with £16,633 for the previous year. Gas sales totalling 1,820,307 therms yielded £118,908 against £105,076 for 1944. The quantity sent out was a record for the Company, the sales showing an increase of 5.3% over 1944. The final dividends make £11% for the year on the "A" Ordinary stock and £7 14s.% on the "B" Ordinary stock, leaving £10,221 to be carried forward to the next account.

The Spring Meeting of the North British Association of Gas Managers is to be held in the Lesser Town Hall, Coatbridge, on Friday, April 12, at 10.30 a.m., when the Presidential Address will be delivered by Mr. T. S. Lockhart, Rothesay.

Darlington Gas Department is to supply gas to the former Royal Ordnance factory at Aycliffe, which is being converted into a trading estate. Over 6,000 yards of main will be needed, and the cost is expected to be over £8,400. The Corporation is in touch with North-Eastern Trading Estates, Ltd., Gateshead, on the matter.

GAS PRODUCTS PRICES

The London Market Mar. 4.

There are no changes to report in the prices of Coal Tar products, the majority of which are controlled either by Government Order or by agreements.

The following are controlled by Government Orders at the prices indicated:—

Road tar at 5¼d. per gallon filled into buyers' tanks at sellers' works, with corresponding prices when delivered and when supplied in packages.

The price sprayed direct on to roads is controlled by agreement and is 8½d. per gallon for full tank loads in London and adjacent counties.

Creosote for hydrogenation is based on 5.875d. per gallon and creosote for timber preservation on 5½d. per gallon *ex* sellers' works, with the usual extras for different qualities, packages, &c.

The basic price for cresylic acid is 3s. 6d. to 5s. per gallon, according to grade.

Hot pressed naphthalene costs £11 11s. in bulk *ex* distillers' works. Prices for refined naphthalene vary from £20 15s. per ton for crystal on 50-ton contracts to £26 15s. per ton for ball and flake. These prices are delivered England and Wales in 2-cwt. bags, minimum 4-ton lots.

The maximum prices for coal tar naphtha vary from 1s. 11d. to 2s. 11d. per gallon and for xylol from 3s. 3½d. to 3s. 6d. per gallon delivered buyers' address in minimum 1,000-gallon lots in bulk. The maximum price for pure toluene is 3s. 2¼d. per gallon in bulk *ex* sellers' works.

The following prices are controlled by agreements:—

Pitch for briquetting is 70s. per ton *ex* sellers' works in bulk.

Phenol is 9½d. to 11½d. per lb. in large returnable drums delivered buyers' address, according to quantity.

The Provinces Mar. 4.

The average prices of gas-works products during the week were: Pitch, 70s. per ton; toluole, naked, North, 90's, 2s. 4d. to 2s. 6¾d. per gallon; pure, 3s. 2¼d. Prices for carbolic acid 60's, anthracene, creosote oil (hydrogenation), coal tar oils (timber preservation, &c.), and strained anthracene oil are controlled by S. R. & O. 1943, 1538, and for naphthalene by S. R. & O. 1944, 1051. Prices for road tar were increased by a half-penny per gallon by S. R. & O. 1945, 229, under which Order there was also an increase of 5s. per ton in the price for standard creosote-pitch mixture.

The bulk of the pitch produced in this country is required for home trade purposes but certain quantities are being sent at higher prices to Allied countries with the approval of the Coal Tar Control. So far as creosote is concerned the bulk is required for essential purposes, at controlled prices. With regard to hydrocarbon oils, the prices remain fixed, although there is more freedom than was previously the case.

Scotland Mar. 2.

Demand continues strong with prices firm, especially for export. Refined tar*: Yield to the Distillers is 5d. per gallon *ex* Works, naked. Creosote oil: Timber preserving quality,* 5¼d. to 6½d. Hydrogenation oil,* 5¾d.; low gravity or virgin oil,† 7½d. to 7½d.; benzole absorbing oil,* 6½d. to 8d. per gallon. Refined cresylic acid* is 3s. 6d. to 4s. 6d. per gallon *ex* Works, naked, according to quality. Crude naphtha†: 7d. to 8d. per gallon. Solvent naphtha*: Basic maximum prices delivered in bulk, 90/160 grade, 2s. 10d., and 90/190 Heavy naphtha, Unrectified, 2s. 0½d.; Rectified, 2s. 4d. per gallon. Pyridine†: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

* Price controlled. † Uncontrolled.

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GAS STOCKS AND SHARES

There was slightly more activity on the Stock Exchange last week, and the chief factor was again the continued strength of British Funds. On the other hand, the industrial market was a little uncertain, but several stocks in the leading groups recorded good gains.

There was also a little more business among gas stocks and shares, and the upward movement which started the previous week was again in evidence, and it will be seen below that several issues recorded improvement. British Ordinary more than recovered the previous week's fall, and Commercial 3% Debenture gained a further 3 points, making a rise of 8 over the past two weeks, while several stocks quickly improved after the *ex. div.* drop. Compared with a month ago it is satisfactory to record that the majority of the price movements have been in an upward direction.

The following were the changes compared with a week ago:—

SUPPLEMENTARY LIST

Croydon 4 p.c. Pref. (x.d.)	97—102	Feb. 25
East Wight Cons. (x.d.)	107—112	,,

PROVINCIAL EXCHANGES

Exeter 10 p.c. (x.d.)	185—195	Feb. 18
Great Grimsby "A" Ord. (x.d.) ...	185—195	,,
,, ,, "B" Ord. (x.d.) ...	185—195	,,
,, ,, "C" Ord. (x.d.) ...	175—185	,,
Newcastle 4 p.c. Pref.	99—101	—1

OFFICIAL LIST

Bombay	41/6—43/6	—/6d.
British Ord.	118—123	+3
Commercial Ord. (x.d.)	67—72	Feb. 25
Ditto 3 p.c. Deb.	81—86	+3
Croydon Sliding Scale	118—123	+2
Gas Light 3½ p.c. max.	83—86	+1
Ditto 3 p.c. Deb.	90—93	+1
Ditto 5 p.c. Red. Deb.	104½—107½	+½
Imperial Continental Ord.	111—116	+2
Liverpool Ord....	113—116	+½
Mid-Southern 4 p.c. Cum. Pref. ...	100—103	+2½
Oriental	203—213	+3
Primitiva Holdings Ltd.	12/6—13/6	—/3d.
South-Eastern Gas Corporation 4½ p.c. Red. Pref. (x.d.) ...	19/6—21/6	Feb. 25
South Suburban Ord.	107—112	—1

Quotations on the London and Provincial Stock Exchanges

OFFICIAL LIST

Issue. £	When ex-Dividend.	Dividends interest. Amnt. or Rate% Prev. Hf. Yr. Actual.	Last Hf. Yr. Actual.	NAME.	Quotations Feb. 28
1,767,439	Sept. 10	20/-	30/-	Alliance & Dublin Ord. ...	122—127
900,018	Oct. 29	6d.	6d.	Assed. Gas & Water U'd'ts Ord.	20/—21/-
389,000	,,	7½d.	7½d.	Do. Deferred	20/—21/-
500,000	Sept. 3	2½	2½	Do. 4½ p.c. Red. Cum. Pref.	20/—22/-
536,000	,,	2	2	Do. 4 p.c. Red. Cum Pref.	19/—21/-
342,000	,,	2	2	Do. 4 p.c. Irred. Cum. Pref.	19/3—20/3
561,370	Feb. 18	70/-	70/-	Barnet Ord. 7 p.c.	155—160
300,000	Oct. 8	10½d.	8½d.	Bombay, Ltd.	41/6—43/6
690,526	Feb. 11	70/-	70/-	Bournemouth 7 p.c. max. ...	153—158
362,025	Dec. 17	2	2	Do. 4 p.c. Deb. ...	100—105
659,955	Sept. 10	57/-	41/-	Brighton, &c., 5 p.c. Con. ...	107—112
855,000	,, 24	60/-	60/-	Brit. Gas Light Ord.	118—123
545,000	Dec. 17	2½	2½	Do. 5½ p.c. 'B' Cum. Pref.	112—117
120,000	,,	2	2	Do. 4 p.c. Red. Deb.	95—100
100,000	Oct. 22	4/6	2½	Cape Town, Ltd., 4½ p.c. Cu. Pf.	13/—15/-
626,860	Feb. 11	50/-	70/-	Cardiff Con. Ord.	120—125
24,500	Nov. 12	8½d.	8½d.	Colombo 7 p.c. Pref.	23/6—25/6
764,169	Sept. 24	4.78d.	6d.	Colonial Gas Assn. Ltd. Ord. ..	17/—19/-
400,000	,,	7.649d.	9½d.	Do 8 p.c. Pref. ...	23/—25/-
1,748,090	Feb. 25	—	40/-†	Commercial Ord.	67—72
620,000	Dec. 10	1½	1½	Do. 3 p.c. Deb.	81—86
286,344	Feb. 18	2½	2½	Do. 5 p.c. Deb.	111—116
807,560	,,	60/-	60/-	Croydon sliding scale	118—123
644,590	,,	50/-	50/-	Do. max. div.	102—107
620,385	Dec. 31	2½	2½	Do. 5 p.c. Perp. Deb. ...	117—122
179,500	,, 18	50/-	50/-	East Surrey 'B,' 5 p.c.	101—106
176,461	,, 27	2½	2½	Do. 5 p.c. Deb. (Irred.)...	117—122
239,135	Nov. 12	7½d.	6d.	Gas Consolidation Ord. 'A' ...	20/—22/-
250,000	,,	4½	4½	Do. Ord. 'B' ...	19/—21/-
250,000	,,	2	2	Do. 4 p.c. Red. Cum. Pref.	18/6—20/6
19,101,877	Feb. 18	6d.	6d.	Gas Light & Coke Ord. ...	21/3—22 3/a
2,600,000	,,	35/-	35/-	Do. 3½ p.c. max.	83—86
4,477,106	,,	2	2	Do. 4 p.c. Con. Pref. ...	99—102
2,993,000	Dec. 31	1¾	1¾	Do. 3½ p.c. Red. Pref. ...	99—102
8,602,497	,, 3	1½	1½	Do. 3 p.c. Con. Deb. ...	90—93
3,642,770	,,	2½	2½	Do. 5 p.c. Red. Deb. ...	104½—107½
3,500,000	,,	2½	2½	Do. 4½ p.c. Red. Deb. ...	104½—107½
700,000	Sept. 17	1½	1½	Do. 3½ Red. Deb. ...	98—100
5,600,000	May 28	—	†£10	Imperial Continental Cap. ...	111—116
43,340	Jan. 28	1½	1½	Do. 3½ p.c. Red. Deb. ...	99—102
2,167,410	Feb. 11	60/-	55/-	Liverpool Ord.	113—116
231,978	,, 18	50/-	50/-	M.S. Utility 'C' Cons.	101—106
918,657	,,	2	2	4 p.c. Cons. Pref.	100—103
675,000	Nov. 12	‡40/-	‡40/-	Montevideo, Ltd.	118—123
300,000	Dec. 10	£4	£6	Oriental, Ltd.	203—213
368,537		57/6	50/-	Plymouth & Stonehouse 5 p.c.	108—113
621,667	Feb. 11	72/6	72/6	Portsmouth & Gosport Cons.	145—155
2,386,371	July 9	†9½d.	†9½d.	Primitiva Holdings, Ltd. Ord.	12/6—13/6
226,860	Dec. 10	3	3	Do. 6½ p.c. Red. Cum. Pref.	100—105
648,999	Sept. 10	6¾	6¾	Severn Val. Gas Cor. Ld. Ord.	20/6—22/6
597,972	,,	2½	2½	Do. 4½ p.c. Cum. Pref. ...	20/—22/-
2,528,714	Aug. 27	6d.	3½d.	South East'n Gas Cn. Ld. Ord.	19/6—20/6
1,000,000	Feb. 25	2½	2½	Do. 4½ p.c. Red. Cum. Pref.	19/6—21/6
1,068,869	,,	2	2	Do 4 p.c. Irred. Cum. Pref.	19/6—20/6
6,709,895	,, 11	30/-	50/-	South Met. Ord.	92—95
1,135,812	,,	3	3	Do. 6 p.c. Irred. Pref. ...	122—127
850,000	,,	2	2	Do. 4 p.c. Irred. Pref. ...	98—102
1,895,445	Dec. 31	1½	1½	Do. 3 p.c. Perp. Deb. ...	88—91
1,000,000	July	2½	2½	Do. 5 p.c. Red. Deb. ...	101—106
1,543,795	Feb. 4	50/-	50/-	South Suburban Ord. 5 p.c ...	107—112
512,825	,,	2½	2½	Do. 5 p.c. Perp. Pref. ...	109—114
500,000	,,	2	2	Do. 4 p.c. Perp. Pref. ...	98—103
250,000	,,	1¾	1¾	Do. 3½ p.c. Red. Pref. ...	97—102
888,587	Dec. 10	2½	2½	Do. 5 p.c. Perp. Deb. ...	117—122
750,541	Feb. 11	50/-	50/-	Southampton Ord.	104—109
350,000	,,	2½	2½	Swansea 5½ p.c. Red. Pref. ...	102—107
1,076,490	Aug. 7	50/-	50/-	Tottenham & District Ord. ...	110—115
338,555	,,	2½	2½	Do. 5 p.c. Pref.	108—113
453,380	Dec. 10	2	2	Do. 4 p.c. Perp. Deb. ...	100—105
1,483,664	Nov. 12	7½d.	6d.	U. Kingdom Gas Cor. Ord. ...	21/—22/-
1,085,952	,,	5½d.	5½d.	Do. 4½ p.c. 1st Cum. Pref. ...	20/—22/-
772,709	,,	4½d.	4½d.	Do. 4 p.c. 1st Red. Cum.Pref.	20/—21/-
745,263	Dec. 17	5½d.	5½d.	Do. 4½ p.c. 2nd Non.Cum. Pf.	19/—21/-
1,200,000	Sept. 17	1¾	1¾	Do. 3½ p.c. Red. Deb. ...	97—102
380,608	Aug. 13	66/3	66/3	Uxbridge, &c., 5 p.c.	125—130
1,371,138	Feb. 18	50/-	50/-	Wandsworth Consolidated ...	107—112
2,525,768	,,	2	2	Do. 4 p.c. Pref.	99—102
1,343,964	Dec. 17	2½	2½	Do. 5 p.c. Deb.	117—122
383,745	,,	2	2	Do. 4 p.c. Deb.	100—105
558,342	Feb. 18	50/-	50/-	Watford & St. Albans Ord. ...	108—113

SUPPLEMENTARY LIST

Issue. £	When ex-Dividend.	Dividends interest. Amnt. or Rate% Prev. Hf. Yr. Actual.	Last Hf. Yr. Actual.	NAME.	Quotations Feb. 28
351,685	Dec. 17	2½	2½	Brighton, &c., 5 p.c. Perp. Deb.	117—122
415,250	,,	2	2	Bristol Gas Co., 4 p.c. New Deb.	101—104
140,205	Feb. 11	70/-	70/-	Cambridge, &c., 7 p.c. Cons. 'B'	135—140
295,932	Aug. 20	50/-	50/-	Cheltenham, 5 p.c. Cons. Ord....	105—110
42,500	Dec. 17	2	2	Do. 4 p.c. Perp. Deb....	97—102
150,000	Feb. 25	2	2	Croydon Gas, 4 p.c. Pref. (Irr.)	97—102
130,000	Dec. 31	2	2	Do. 4 p.c. Deb. ...	100—105
53,220	Feb. 18	3	3	East Surrey, 6 p.c. Cum. Pref....	119—124
...	Aug. 19 '40	40/-	40/-	Eastbourne, 'B' 3½ p.c.... ...	97—102
117,425	Feb 25	—	6½†	East Wight Cons. 5 p.c. ...	107—112
156,600	Feb. 18	50/-	50/-	Hampton C't, 5 p.c. Cons. Ord.	105—110
18,000	May 28	—	£7	Malta & Med'n., 7 p.c. 1st Pref.	95—105
50,000	Feb. 18	52/3	52/3	Mid. South. Util., 'A' Cons. 5 p.c.	105—110
70,380	Dec. 17	2½	2½	Newport (Mon.), 5 p.c. Deb...	113—118
65,000	Aug. 13	2½	2½	North Middlesex, 5 p.c. Pref....	107—112
70,000	Sept. 10	2½	2½	Plymouth & Stone., 5 p.c. Deb.	115—120
76,501	Dec. 17	2	2	Reading, 4 p.c. Perp. Deb. ...	97—102
74,777	Oct. 1	2	2	Romford, 4 p.c. Debs. (Reg.) ...	98—103
363,575	Jan. 2	2½	2½	Tottenham, 5 p.c. Reg. Red. Mt.	98—101
202,019	Sept. 24	75/-	75/-	Tunbridge Wells, 4 p.c. Scale ...	137—142
135,257	Dec. 3	2½	2½	Uxbridge &c., 5 p.c. Perp. Deb.	115—120

PROVINCIAL EXCHANGES

Issue. £	When ex-Dividend.	Dividends interest. Amnt. or Rate% Prev. Hf. Yr. Actual.	Last Hf. Yr. Actual.	NAME.	Quotations Feb. 22
804,948	Aug. 7	2½	2½	Bath Cons.	113—115
122,577	Feb. 18	3	4	Blyth 5 p.c. Ord.	122—124
1,667,250	,, 11	2½	2½	Bristol, 5 p.c. max.	113—115
120,420	Dec. 17	2	2	Do. 1st 4 p.c. Deb.	101—103
415,250	,,	2	2	Do. 2nd 4 p.c. Deb. ...	100½—102½
3 28,790	,,	2½	2½	Do. 5 p.c. Deb.	119—121
157,150	Feb. 4	2½	3½	Chester 5 p.c. Ord.	115—117
52,500	Dec. 17	2	2	Do, 4 p.c. Cum. Pref. ...	98—100
40,000	,,	2	2	Do. 4 p.c. Non. Cum. Pref.	98—100
36,430	,,	1½	1½	Do. 3½ p.c. Deb.	87—91
41,890	,,	2	2	Do. 4 p.c. Red. Deb. ...	99—101
542,270	Aug. 7	4½	3	Derby Cons.	132—137
55,000	Dec. 17	2	2	Do. 4 p.c. Deb.	97—102
40,000	Feb. 18	5½	5½	Exeter 10 p.c.	185—195
10,000	,,	5	5	Great Grimsby 'A' Ord. ...	185—195
6,500	,,	5	5	Do. 'B' Ord. ...	185—195
79,000	,,	5		Do. 'C' Ord. ...	175—185
732,000	,,	2	2½	Hartlepool G. & W. Cn. & New	91½—93½
490,681	Dec. 17	1½	1½	Liverpool 3½ p.c Red. Deb. Stk.	95—100
245,500	,,	2	2	Do. 4 p.c. Red. Deb. Stk.	101—102
306,083	Dec. 31	2	2	Do. 4 p.c. Deb.	101—103
680,000	Nov. 28	2½	2½	Do. 5 p.c. Red. Stk. ...	104—109
20,000	,,	2½	2½	Long Eaton 5 p.c. Pref.	9—11
80,000	,,	2½	2½	Do. 5 p.c. Deb.	117—122
2,430,267	Feb. 11	2½	2½	Newcastle and Gateshead Con.	24/3—24/9a
682,856	,,	2	2	Do. 4 p.c. Pref.	99—101
776,706	Dec. 27	1½	1½	Do. 3½ p.c. Deb.	98½—99½
250,000	,,	1½	1½	Do. 3½ p.c. Red. Deb. ...	98½—100½
73,186	Oct. 29	2	2	Do. 4 p.c. Red. Deb. ...	102—104
106,280	Feb. 4	5	5	Preston 'A' 10 p.c.	195—200
188,219	,,	3½	3½	Do. 'B' 7 p.c.	145—150
1,806,339	Aug. 27	3½	3½	Sheffield Cons.	130—135
95,000	Jan. 7	2	2	Do. 4 p.c. Deb.	98—102
332,351	Feb. 4	3	3	Sunderland 6 p.c. max. ...	122½—124½
182,150	,, 11	2½	2½	Weston-super-Mare Cons. ...	112—114
64,338	Dec. 31	2	2	Do. 4 p.c. Deb.	99—101
33,340	,,	3½	3½	Do. 7½ p.c. Deb.	145—150

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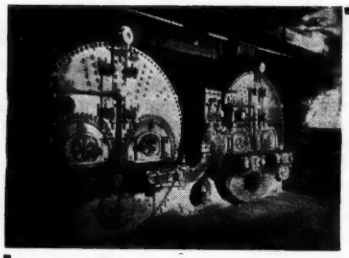

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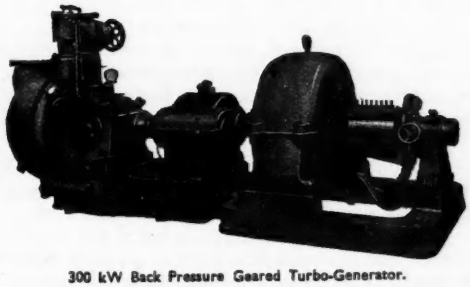

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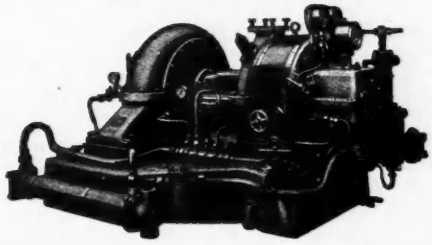

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